



Wyoming State Capitol

Condensate System and Ventilation Study



October 11, 2002

CATOR, RUMA & ASSOCIATES, CO.

CONSULTING MECHANICAL/ELECTRICAL ENGINEERS

The State of Wyoming

**Dept. of Administration and Information
General Services Division**

Capitol Building Condensate System and Ventilation Study

October 11, 2002

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I. Project Scope



I. PROJECT SCOPE

The State of Wyoming contracted Cator, Ruma & Associates, Co. to perform a mechanical engineering study and submit a summary report for the replacement of steam condensate piping and the addition of mechanical ventilation in the Capitol Building. Concurrently, the study includes discussion on the replacement of condensate drain piping in the Supreme Court Building. The purpose of the study is to prepare a report that defines the scope, schedule and budget of the construction project to accomplish the recommended improvements. The Scope of work is as stated below:

1. CAPITOL BUILDING

Review the condition of the leaking steam condensate piping and evaluate whether the steam and steam condensate system should be replaced with a heating hot water system. The analysis will be based on what is best for the building and the occupants.

Determine the best method for providing ventilation to all occupied areas of the building. Currently operable windows provide ventilation at the perimeter of the building. For security reasons, it is desired to secure the windows in the closed position.

2. SUPREME COURT AND STATE LIBRARY BUILDING

Review the condition of the leaking cooling coil condensate drain and evaluate replacement requirements.

As part of the review of the Capitol building, several environmental issues were also reviewed. Specifically, the indoor air was monitored for ASHRAE 62 contaminants. Additionally, the building was checked for the following hazardous materials: Lead, radon, asbestos and formaldehyde. Monitoring and testing was completed at locations most likely to contain the contaminant or hazardous material. When the actual design of this project is underway, checking for hazardous materials at the specific construction location is advised. It is expected that construction materials throughout various additions are not necessarily consistent.

This report includes findings, recommendations, an approximate project schedule and a budget for the various options investigated. Both the Capitol Building and the Supreme Court Building will be fully occupied during construction. Therefore, a conceptual construction-phasing schedule has been developed to identify the duration of construction to complete the project. Both buildings are of historical significance. Consequently, the solutions and the associated budget have taken into account maintaining aesthetic values.

The conceptual design description will identify advantages and disadvantages for the various options.

II. Approach



II. APPROACH

The State Capitol Building's mechanical systems and architecture were reviewed in detail along with the occupancy schedule in order to find solutions to the leaking steam condensate pipe and to provide mechanical ventilation. Mechanical system drawings were reviewed and maintenance personnel were interviewed to assist in the analysis.

The heating system was reviewed and a benefit analysis was performed to identify whether the building heating system should remain as a steam system with new steam condensate piping or whether the steam heating system should be replaced by either a heating hot water system or a new steam and steam condensate system.

The building's mechanical ventilation system currently provides ventilation to the interior of the building. This existing system was reviewed to determine modifications necessary to provide ventilation to the entire building. Airborne contaminants were reviewed in order to provide recommendations for improving indoor air quality. An industrial hygienist reviewed airborne contaminants as well as hazardous materials content in the building.

The Supreme Court Building's HVAC system and architecture were reviewed in detail along with the occupancy schedule in order to find solutions to replacement of the cooling coil condensate drain piping. The majority of the piping is exposed. It is expected that routing would be the same as existing routing.

Cator, Ruma & Associates, Co. retained the services of Century Environmental Hygiene, Inc. to perform industrial hygiene services. Cator, Ruma also retained the services of The Design Studio to perform building documentation (architectural layouts) services and to generate an occupancy schedule, and assist in providing design solutions that retain the historical significance of the buildings.

At the request of Department of Administration and Information personnel, Cator, Ruma & Associates attended meetings with the City of Cheyenne Fire Prevention Bureau, Building Department and the State of Wyoming Fire Marshal. The purpose of the meetings were to determine whether fire sprinklers, fire alarm or other life safety enhancing improvements would be required at the time the mechanical system upgrades were completed.

III. Executive Summary



III. EXECUTIVE SUMMARY

1. CAPITOL BUILDING

Steam Condensate Piping

The steam condensate pipe is over eighty (80) years old and is leaking at the threaded joints . This is a common occurrence for pipe of this age and type of service. To prevent future water damage problems, it is recommended to replace the condensate system. The steam pipe is also over eighty years old and is likely to develop leaks within ten (10) years. Predicting failure is very difficult for this type of system. However, due to the necessary replacement of the condensate system, and the extensive disruption of normal operations to complete this work, it is recommended to replace the steam pipe system as well.

There are two system options to consider when this work is performed. Either replace the system as it is (steam and steam condensate), or provide a heating hot water system. If the system were installed today, the optimum system is heating hot water. It provides much better temperature control, is quieter and less maintenance is required.

The final step in a complete replacement approach is to replace the fan coil units (FCUs) at the perimeter of the building. These units are twenty-six (26) years old, six (6) years beyond their median service life, which means within four years, substantial failures are eminent.

Selecting the complete replacement approach has a substantial benefit. All work can be completed at one time, which limits interruption to a one-time occurrence. Future work in the occupied area of the building would only be required for routine maintenance and catastrophic failure. The new system in the occupied zone would last in excess of twenty (20) years.

Per discussions with the Facilities staff, the other mechanical and electrical systems in the occupied zones are expected to be in good working condition excluding the ventilation system. See "Ventilation System" for more information.

Ventilation System

The current method of ventilation for the perimeter of the building is operable windows. Due to security concerns, it is desirable to secure the windows in the closed position. From an indoor air quality standpoint, it is desirable to have mechanical ventilation because the air is filtered and under all occupied conditions, outside air is delivered to the space not just when the windows are open. The health, safety and welfare of the occupants will be improved with

mechanical ventilation. Indoor air quality will improve in all occupied areas of the building at all times of the year.

Generally, indoor air pollutants were in the acceptable range, however, in a few spaces, mold spore and carbon dioxide levels were elevated. It is expected that both mold spore and carbon dioxide levels would decrease when mechanical ventilation is introduced to the building.

A potentially toxic mold spore (stachybotrys) was found predominately in the basement. It does not appear that the source of the stachybotrys is in the Capitol Building. It is most likely coming from the connector link between the Capitol Building and the Herschler Building. Radon testing indicated that in the basement, levels were just above the acceptable range.

To mitigate the propagation of stachybotrys into the Capitol Building and to reduce radon levels, a mechanical ventilation system could be used to positively pressurize the building and dilute radon levels. This feature would also significantly reduce undesirable infiltration.

There are two options for providing mechanical ventilation. The first option is to replace the existing air-handling equipment with 100% outside air air-handling equipment and redistribute the air to every room in the building. Some interior spaces will need additional HVAC equipment (fan coil units) similar to the perimeter spaces.

The second option would be a slight variation of the first option. New air-handling units (AHU) would be required to replace the existing outdated AHUs. Additional dedicated ventilation AHUs would be required to provide mechanical ventilation, predominantly to the perimeter of the building. This approach would impact the occupied spaces the least. The new "ventilation only" AHUs would be located in the attic.

To accomplish the work necessary for mechanical ventilation, new duct shafts will need to be run in certain portions of the building. Actual locations will need to be coordinated during the design phase of this project to maintain the historical significance of the building. Additionally a majority of the acoustical tile ceilings will need to be removed in support of the mechanical work.

Based upon our initial meeting with the City of Cheyenne Fire Prevention Bureau, a complete fire sprinkler system and fire alarm system will be required at the time of the mechanical system upgrades. In a subsequent meeting with the City of Cheyenne Building Officials, it was determined that additional exit signage and maximum occupancy signs shall be posted (in assembly areas).

2. SUPREME COURT AND STATE LIBRARY BUILDING

Cooling Coil Condensate Drain

The cooling coil condensate drain that services each of the fan coil units (FCU) is a relatively small diameter pipe. This pipe has a tendency to leak and clog. Both conditions are signs of age. When the system clogs, water will leak on to the floor of occupied spaces causing water damage. Due to the water damage, it is recommended to replace the cooling coil condensate drain. Most of this pipe is exposed and replacement will be straight forward.

Due to the fact that the drain is exposed, it is anticipated that replacement could be accomplished at night or on weekends. The main drains in the crawl space are easily accessible and replacement of these lines could occur during the winter months when the drain system is inactive.

In review of the building mechanical system, it was found that the FCU and air handling units (AHU) are near the end of their service life. One AHU is over sixty years old and should definitely be replaced. The other AHU and FCUs should be replaced within five years.

3. RECOMMENDATIONS

Provide a new heating hot water system consisting of piping distribution to all fan coil units, radiators and air-handling units. Provide heating hot water pumps, heat exchanger and controls. Replace all Fan Coil Units (160 units). Provide mechanical ventilation consisting of new air-handling units, additional duct distribution and new shafts. Provide fire sprinkler and fire alarm systems. Replace condensate drain in Supreme Court Building.

For all recommendations, mold spore remediation is recommended and fire sprinklers and fire alarm are required. The mold spore remediation has a direct effect on health. The fire sprinkler and fire alarm are required by the Fire Prevention Bureau.

Total Project Cost \$6,140,000

Complete project in four construction phases over four years.

Other Options

1. Provide new steam and steam-condensate heating system. Replace all FCUs. Provide mechanical ventilation. Replace condensate drain in Supreme Court Building. Provide fire sprinkler and fire alarm systems.

Total Project Cost \$6,030,000

Complete project in four phases over four years.

2. Replace steam condensate only. Do not replace steam piping, FCUs, or provide mechanical ventilation. Replace condensate drain in Supreme Court Building. Provide fire sprinkler and fire alarm systems.

Total Project Cost \$1,985,000

Complete project in two to four phases over two to four years.

The probable construction cost for replacing the cooling coil condensate drain in the Supreme Court and State Library Building is \$120,000.

IV. Detailed Discussion



IV. DETAILED DISCUSSION

1. DESCRIPTION OF STATE CAPITOL BUILDING

The State Capitol Building is located on 24th Street between Central and Carey Avenue in downtown Cheyenne, Wyoming. The original building was constructed in the late 1880's. Additional wings were completed in 1890 and the final two wings were completed in 1917. The building was listed on the National Register of Historical Places in 1973. There are four occupied floors, basement through third floor plus an attic. Each floor is approximately 25,000 square feet. The structure is brick, wood and steel and the exterior is sandstone with a standing seam copper roof.

The building is occupied by several agencies. Among these are the Governor's Office, Secretary of State, Auditor, Treasurer, Attorneys General and Legislative Services Office. The Senate Chambers are located in the West Wing and the House Chambers are located in the East Wing.

The building is open to the public and the building occupancy significantly increases when the Senate and House are in session.

Recently the Capitol Building underwent a relighting project, which reduced energy consumption. Compact fluorescent, T-8 fluorescent and incandescent task lighting at the desks provides lighting.

The building is heated and cooled by one of two methods. Four pipe fan coil units service exterior portions of the building. Chilled water provides the cooling and steam provides the heating. Fan coil units or air handling units service the interior portions of the building. The fan coil units and air-handling units are over 26 years old and will need to be replaced within four (4) years. The following graphic identifies the dramatic increase in risk of equipment failure as the equipment ages. For a building of this type, 120% of the rated service life is a general guideline for equipment replacement.

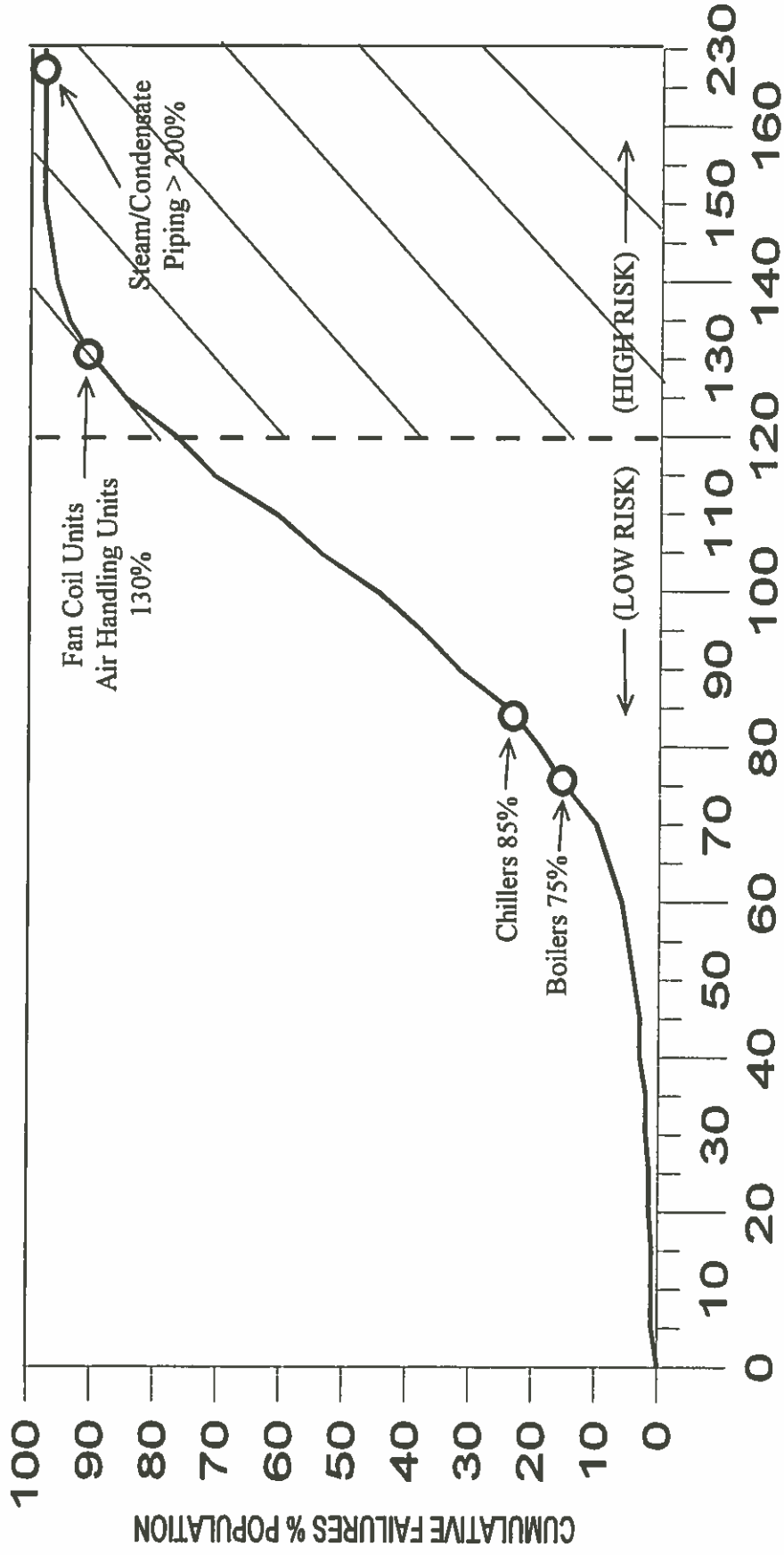
See ASHRAE Listed Service Life Graph on the next page.

The chillers and boilers for this facility are located below the plaza between the Capitol Building and the Herschler Building. Two chillers are 19 years old and use a refrigerant no longer being manufactured due to EPA regulations. If sufficient refrigerant is available, the chillers may last up to ten more years. The median service life of these chillers is twenty-three (23) years. At this point, it is not advisable to undergo refrigerant change out. When these chillers start to show signs of significant degradation, replacement as opposed to repair is highly advised. A third chiller is in a similar situation except that it is 16 years old. The fourth chiller is only four years old and it's refrigerant has a scheduled phase out

Wyoming Capitol Building - Mechanical Systems Analysis

CRA Project #C02-096

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% OF ASHRAE LISTED SERVICE LIFE

date of 2020. Barring any catastrophic failure, this chiller should last approximately 20 more years.

All the chillers are centrifugal type with inlet vanes for unloading. These types of chillers are very good for this application.

The boilers are 19 years old and are fire-tube type. The boilers were retubed in 1996 and barring any catastrophic failure they could last 10 to 20 years. The median service life of fire-tube boilers is twenty-five (25) years, however, if the equipment is well maintained, they should last over thirty (30) years.

In approximately 1985, a severe storm caused flooding of the boiler and chiller rooms. Due to the flood, the equipment in the boiler and chiller rooms needs to be closely monitored and maintained.

The fire protection system of the building consists of a standpipe and fire hose valves, which are located in the center core of the building. The building does not have sprinklers or any type of smoke evacuation system.

Steam Condensate Options

The steam condensate pipe system in the Capitol Building has been leaking at various locations. The leaks are occurring at concealed locations, which makes repairs difficult and greatly interrupts building operations. Water from the leaks can travel inside wall and ceiling cavities, which provide a breeding ground for mold. The condensate pipe system is approximately 90 years old and needs to be replaced.

The leaks are occurring at threaded joints. This often happens with pipe of this age and used for this type of service. Steam condensate can be aggressive in terms of breaking down steel pipe. Three samples of the pipe were analyzed by Summit Laboratories, Inc., 1776 East 58th Avenue, Suite E, Denver, CO 80216 to determine the cause of failure. The results indicated that at one time, chemical treatment for the boiler makeup water was potentially inadequate. Currently, the chemical treatment meets or exceeds today's standards.

The potential problems that are caused by inadequate water treatment are due to three issues; oxygen content of makeup water, mineral content of makeup water and condensate corrosion. Oxygen content needs to be very low, if not, it can cause intense pitting type corrosion. The remedy is a deaerated and chemical oxygen scavengers.

Mineral content is an issue because over time, mineral scales can form on the heat exchange surface, which reduces heat transfer. Ultimately, this may cause non-uniform hot spots resulting in metal failure.

Condensate corrosion is the result of bicarbonate alkalinity in the makeup water. The high alkalinity causes carbonic acid to form. The acidic conditions cause rapid failure of heat exchangers and piping. To remove alkalinity, the most common method is to use neutralizing amines.

Since the steam condensate system is in need of replacement, it is a good idea to replace the steam system while the building is disrupted for a significant construction effort. The likelihood of steam pipe failure is fairly high due to its age. There are two options in this replacement effort. Replace the system with a "like" system; steam and steam condensate. The second option is to install a heating hot water system.

For a building of this type, heating hot water would be a better solution. The heating hot water can be generated via new steam to water heat exchangers located in the boiler room. The source for heat would still be the fire tube steam boilers. New heating hot water pumps would circulate water through the heat exchanger to the coils. Less maintenance is required, the system is easier to control and typically this system is much quieter. The steam heating system requires a steam trap at every fan coil unit that translates to a constant maintenance item and potentially a waste of energy (steam traps that fail in the open position will pass steam until they are fixed). This is the major maintenance difference between the two systems; over 200 steam traps versus two heating hot pumps. With the proposed heating pumps located in the basement Mechanical Room, maintenance would be considerably easier. Refer to Construction Cost Opinion section for costs of each option.

The new heating hot water pumps will be served from an existing panelboard located in the old chiller room. This is the same room where the pumps will be located. The existing 208/120V panelboard is fed from the Capitol Building's electrical service and has space in the panelboard for additional breakers. Cheyenne Light Fuel & Power's existing demand meter reading indicates that the building electrical service has available space capacity and that these pumps can be added to this service. The successful electrical contractor will be required to meter the existing branch panelboard for load verification to insure the branch panelboard has available spare electrical capacity.

Proceeding with the complete replacement approach has a very attractive benefit. Work has to be performed in office spaces. Therefore, occupants need to be temporarily relocated. It would make sense to do as much work as possible instead of a small portion of the work. The likelihood of having to go into these spaces in the near future is very remote once everything is replaced.

Mechanical Ventilation Options

Ventilation for the Capitol Building is accomplished by operable windows and air handling units, which have outside air intakes. Capitol Building personnel would

like to keep the windows closed due to security issues; therefore, mechanical ventilation would be required for the entire building. There is an extra benefit in providing mechanical ventilation. The benefit is that ventilation would be available at all times, not only when the windows are open.

With mechanical ventilation, the indoor air is continually being exchanged, which substantially reduces carbon dioxide levels as well as other bioeffluents. Based on a study performed by American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE See ASHRAE Journal, July 2002), increased ventilation significantly reduces sick leave.

An additional benefit to mechanical ventilation is the ability to substantially control contaminants from infiltration. The mechanical ventilation system can be designed to positively pressurize the building and then control how air is brought into the building.

There are two options to providing mechanical ventilation:

1. Replace the air-handling units (AHUs) in the attic and two units in the basement with 100% outside air units and modify the ductwork so it distributes to all the spaces in the building. The new units would provide only tempered ventilation air. The areas that were previously heated and cooled by AHUs would need fan coil units and associated piping distribution. This includes portions of the Governor's area, the Attorneys General's area, interior portions of the Basement and First Floor (west end) and the House and Senate Chamber lobbies.
2. Replace the same AHUs identified in Option 1, however, ductwork distribution to existing spaces would remain the same. Provide additional AHUs and ductwork to be distributed to the spaces not currently mechanically ventilated (perimeter spaces). The new AHUs in this option would need be located in the attic. The units would also need to be a high percentage of outside air to accomplish the ventilation requirements.

For both options, additional chilled water and heating pipes would need to be routed from the basement chiller and boiler rooms. It is anticipated that there is sufficient capacity in the chiller and boiler systems.

The new air handling units will be served from a new surface mounted branch panelboard located in the attic space. The panel will be mounted adjacent to an existing panel and will be fed from the existing Capitol Building's 208/120V main distribution board located in the Basement. New raceway, wiring and circuit breakers will be provided for the new panelboard to serve the air handling units. Conduit routing will follow mechanical piping from the basement to the attic. Cheyenne Light Fuel & Power's existing demand meter reading indicates

the building's electrical service has available spare capacity and that these air handlers can be added to this service.

Distinction needs to be made that as ventilation is added throughout the building, complete air conditioning is not going to change. Indirect air conditioning will be provided to corridors and toilet rooms due to the transfer of conditioned air through these areas to exhaust systems.

The occupant load factor for ventilation systems in a fully occupied building using ASHRAE 62 guidelines is 20 cfm/person.

Exhaust fans in the attic would maintain building pressurization. Space static pressure would control variable frequency drives on the exhaust fans.

Option one would have a slightly greater impact to the space because fan coil units would take up floor space and distribution piping would need to be brought to all floors.

Option two would only have additional heating and cooling pipes routed in the basement and up to the attic and no additional fan coil units would be required.

Fire Sprinklers

Based upon our initial meeting of October 3, 2002 with the City of Cheyenne Fire Prevention Bureau, a complete fire sprinkler system and fire alarm system (see fire alarm discussion below) for the entire building will be required at the time of any mechanical system modifications. It is the opinion of Assistant Chief, Bill McHenry, that whether the project is a steam condensate piping replacement project or a complete mechanical system refurbishment, sprinklers and fire alarm system need to be budgeted for this project. At this time, the State Fire Marshal will defer all decisions on the addition of fire sprinklers to the City.

The building currently is partially sprinkled (Basement only) with wet standpipes and fire hose cabinets. The existing fire entry is 6" and incorporates backflow prevention. This water entry will be adequate for the added fire sprinklers. New fire sprinkler risers from the Basement to the attic will need to be provided.

The existing standpipes and fire hose cabinets shall remain. The City Fire Department indicated a fire pump would not be required regardless of the system pressure. Currently the water system static pressure is approximately 100 psi.

Fire Alarm

The existing fire alarm system is a very old non-addressable type system. The existing system appears to have minimal coverage throughout the facility. The

proposed new fire alarm system will be an addressable system including new F.A.C.P, notification devices, full building detection, remote LCD annunciator, printer and graphic maps.

2. DESCRIPTION OF SUPREME COURT AND STATE LIBRARY BUILDING

The Supreme Court and State Library Building was built in 1937. It is approximately 56,000 square feet. There are four floors, basement through third. The structure is brick, steel and wood. The exterior face is sandstone. It is located on Capitol Avenue between 22nd and 24th Streets.

The source for heating and cooling is provided by the same systems that service the Capitol Building. Four-pipe fan coil units provide the heating and cooling in the spaces. Chilled water piping and heating water piping are provided to each fan coil unit. The existing 50+ year old steel steam condensate piping was used for the cooling coil condensate drain when the fan coil unit system was installed. Chilled water piping and heating water piping are provided to each fan coil unit.

Condensate Replacement

The identified problematic issue in this building is far less involved. The issue is a leaking and/or clogging condensate piping system. The condensate is from the cooling coils in the fan coil units located at the perimeter of the building. Most of the leaks occur in the basement, however, it is advisable to replace the entire system from the fan coil drain pans to the connection of the plumbing drain in the basement. There is an occasion that the drain clogs at the drain pan, which results in water damage to the floors. The reason the drains clog is due to several elbows within a very short distance coupled with a fairly flat drain pipe. The elbows tend to be a good spot for dirt to collect, which eventually builds up and causes clogging. The flat drain pipe in that area increases the problem.

The drain pans are located within every fan coil unit at the perimeter of the building. This replacement effort is fairly straightforward because for the most part, the pipe is fully exposed. Scheduling of this work as well as occupancy disruption are the major issues. Refer to Construction Cost Opinion section for costs. The Facilities personnel requested replacement utilizing PVC piping.

The analysis for the Supreme Court and State Library building was far less involved. The issues that the State of Wyoming Facilities staff requested investigation on was limited to the cooling coil condensate drain. The heating system is already heating hot water type and at this time, it is not the intention to have the windows secured in the closed position. Mechanical equipment throughout the building is basically in the same condition and the same age as in the Capitol Building. The FCUs and the AHUs should be replaced within five years.

V. Indoor Air Survey



**Indoor Air Survey
Wyoming State Capitol Building
Preliminary Industrial Hygiene Report**

Prepared for:

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**Survey and Report by:
Century Environmental Hygiene, Inc.
Fort Collins, CO**

September 26, 2002

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1.0 Summary

Century Environmental Hygiene was tasked to perform a limited indoor air quality (IAQ) evaluation at the Wyoming State Capitol Building, located at 200 W. 24th Street, Cheyenne, Wyoming. The IAQ evaluation consisted of a limited evaluation of the building for asbestos materials, lead-based paint, mold and other indoor air quality issues, and included sampling for a number of potential air pollutants. Air samples were collected for nitrogen dioxide, sulfur dioxide, carbon dioxide, carbon monoxide, formaldehyde, dust, ozone, radon, asbestos, and molds.

Results of air samples for dusts, nitrogen and sulfur dioxides, ozone, carbon monoxide, and asbestos were below applicable limits. Formaldehyde was not detected in the building. Carbon dioxide readings were below guidelines for the chemical, but may not be representative of levels that would occur during high occupancy periods during cold months. Radon gas results during short-term tests were generally below applicable guidelines, but long term confirmatory tests would be beneficial.

Some new asbestos materials were identified in the building. Most friable asbestos materials are in good condition. The majority of the asbestos in the building is non-friable in form. Some of these materials could be impacted during construction of a new heating and cooling system and would need to be abated. A lot of paint in the building is relatively high in lead content. Depending on the type of construction to be performed, abatement of some paint may be required.

2.0 Purpose & Scope

Century Environmental Hygiene was tasked to perform a limited indoor air quality evaluation at the Wyoming State Capitol Building, located at 200 W. 24th Street, Cheyenne, Wyoming. The work was performed for the Capitol Condensate Replacement project under the direction of the prime consultant, Cator, Ruma & Associates. Briefly, this evaluation included sampling of selected materials for asbestos content, sampling of selected paints for lead content, and sampling of air for several parameters. The air parameters included nitrogen dioxide, sulfur dioxide, carbon monoxide, carbon dioxide, formaldehyde, ozone, dusts, and radon. In addition, the building was evaluated for mold issues. This included sampling air and surfaces for viable and/or non-viable mold.

The work began on August 26 and was completed on September 19, 2002. The work was planned and directed by James Dennison, who is certified by the American Board of Industrial Hygiene (Certified Industrial Hygienist #CP6560). He was assisted by Ms. Deborah Fernandez, a licensed asbestos inspector and Mr. Tom Petty, a licensed lead inspector.

3.0 Methods & Equipment

3.1 Nitrogen Dioxide (NO₂) Sampling

NO₂ was measured using a direct reading instrument (Draeger Miniwarn) configured for simultaneous NO₂ and carbon monoxide measurements. One-hour average readings were

collected at several locations in the building. The NO₂ sensor was within the calibration period recommended by the manufacturer and otherwise used in accordance with instructions.

3.2 Sulfur Dioxide (SO₂) Sampling

SO₂ samples were collected with colorimetric detector tubes (Gastech). The tubes were attached to a piston sampling device during sampling. When air is drawn through the tube, the SO₂ present in the air reacts with an indicating chemical in the tube. The concentration of SO₂ is determined from the length of the color stain in the tube, based on eight pump draws through the tube, the maximum permitted number. The tubes were used prior to their date of expiry.

3.3 Dust Sampling

Samples were collected for dust in the 10 micron (µm) and less range and the 2.5 µm and less range. These are referred to as PM₁₀ and PM_{2.5} samples, respectively. These samples were collected on Teflo 2 µm filters with CIS samplers, in accordance with the established method for sampling. The filters were placed in cassettes inside the samplers with the appropriate 10 µm or 2.5 µm foam and attached to personal sampling pumps calibrated to run at 3.5 liters per minute (LPM). The pumps are designed to maintain constant flow rates under normal increases in filter pressure drop and post calibrations indicated no discrepancies. All pump run times indicated by LCD were identical to clock time and no flow faults were indicated.

The filters were pre-weighed and post-weighed after environmental conditioning by Princeton Analytical Laboratory on a five place analytical balance in accordance with NIOSH method 0600. The difference in weight is attributable to the dust in the air sample.

3.4 Formaldehyde Sampling

Formaldehyde was sampled on colorimetric detector tubes analogously to SO₂. The Gastec colorimetric tubes were used prior to their expiry date. The length of stain was read after five pump draws.

3.5 Carbon Monoxide Sampling

Carbon monoxide (CO) was sampled in two separate ways. To determine an eight-hour average, long-term colorimetric sampling tubes were used (Draeger). These tubes are analogous to the SO₂ colorimetric tubes, except that they are placed in the sampling location for up to eight hours instead of being used for grab samples. The tubes absorb CO in air after passive diffusion rather than in conjunction with the piston pump. The tubes were used prior to their expiry date.

One-hour average samples were also collected. These were collected using the Miniwarn with the CO detector. The detector was within its factory calibration period. It was placed in various building locations for a period of 60 minutes and provided a time-weighted average (TWA) reading of CO for the duration.

3.6 Ozone Sampling

Ozone was sampled with colorimetric sampling tubes in a manner analogous to the sampling for SO₂. The Gastec tubes were used prior to their expiry period.

3.7 Radon Sampling

Radon gas was sampled at several locations in the basement level of the building. The sampling strategy was in compliance with the guidelines described in Indoor Radon and Radon Decay Product Measurement Device Protocols (USEPA, EPA402-R-92004). Briefly, open-faced canisters of activated charcoal were placed for 2.0 days at various locations in the basement. They were placed in locations that were at least one meter from windows, 0.7 meters from the floor, 0.3 meters from walls, and generally 0.3 meters away from other objects. Two duplicate samples and two field blanks were included. After sampling, the canisters were closed and shipped overnight to Rocky Mountain Radon Labs in Littleton, CO. This lab is an NEHA-approved radon analytical lab. The identity of the samples was kept confidential and blanks and duplicates were blinded. The laboratory analyzed the samples using gamma scintillation counters within 24 hours of receipt.

3.8 Asbestos Material Sampling

A limited asbestos material survey was performed to identify major potential forms of asbestos-containing materials (ACMs). This survey was intended to augment the existing survey of materials described in a report issued by Chen Northern, Inc. on January 29, 1990. The first part of the survey included a walkthrough to understand as well as possible the extent of the Chen Northern survey. The second part of the survey involved collection of bulk material samples of materials that were not or may not have been sampled during the original survey. Part of the challenge stems from the fact that not all the asbestos pipe insulation was ever inventoried and prior abatement efforts do not have records to allow removal of inventoried ACMs. Thus, it is essentially necessary to double-check the presence of ACMs in connection with the mechanical systems. The other challenge is the fact that much of the piping in the building is inaccessible and demolition of walls to inspect insulation was not possible. Between the earlier work and the present effort, most ACM is likely to have been identified, nevertheless.

Prior to building demolition or renovation, Wyoming DEQ requires that all building materials be tested for asbestos if they are a "suspect material". This generally includes all building materials other than wood, metal, plastic, and concrete, although certain other materials are also known to be non-suspect. Suspect materials are organized by "homogeneous areas" representing materials of similar type and appearance. These materials are identified in Table 3 by type, locations, and information pertinent to sample

collection. If different patterns of the same type of material are found, e.g., different ceiling tiles, different wall textures, they are ordinarily distinguished by adding Roman numerals (e.g., wall texture I, II etc.) The sampling was conducted in accordance with standard practice as described by USEPA AHERA regulations. AHERA stipulates the number of samples of each material, which must be collected to determine that a material is non-ACM. All the samples of the homogeneous material must be negative for asbestos for that material to be deemed non-ACM. Otherwise, the material must be considered ACM or further sampled. If lab results indicate that the material has a "trace" amount of asbestos in it, it must be treated as ACM until additional analysis by point count procedures is performed to determine if it is non-ACM in accordance with the definition of ACM. ACM is defined as a material containing more than 1% asbestos fibers.

3.09 Asbestos Air Sampling

Air samples were collected for fiber determination based on the fact that asbestos materials are known to exist in the building. These samples can be considered as background samples, as no active asbestos abatement or asbestos disturbance was on going. The air samples were collected and analyzed according to the standard method for fiber analysis, NIOSH Method 7400. In brief, this method involves sampling air through a cellulose ester filter at a known flow rate. The filters are dissolved with acetone and analyzed by phase contrast microscopy. The samples were collected and analyzed by Deborah Fernandez at Century Environmental. Ms Fernandez is a Colorado recognized air monitoring professional and the Century laboratory is recognized as proficient by the American Industrial Hygiene Association PAT program.

3.10 Lead-Based Paint Sampling

The lead-based paint inspection was performed by Accurate Lead Testing, a licensed lead inspecting firm. The inspection was performed using a Scitec MAP 4 X-ray fluorescent detector. In the survey, randomly selected components of various accessible painted component types were sampled.

3.11 Carbon Dioxide Sampling

Carbon dioxide (CO₂) was sampled at up to 60 locations throughout the building using a direct reading (Testo 525) CO₂ analyzer. This analyzer uses an infrared sensor to determine instantaneous readings of CO₂ at the sampling probe. Samples were collected at different points in time on one day, and at the end of the day on alternate days.

3.12 Mold (Surface and Air) Sampling

Mold samples were collected using various media to characterize the mold levels in the building. The sampling plan is driven by the type of information needed regarding mold levels in different locations. Exposure to mold is primarily via inhalation of the spores intermittently released by mold, in some instances causing allergic and other reactions. For

some purposes, collecting samples of settled or airborne spores is the best strategy. Other times, sampling surfaces for viable mold organisms is more informative. Both strategies were used in this project.

Air samples were collected on Air-O-Cell cassettes in accordance with the manufacturer's recommendations. Air was pulled through the cassette with a high volume vacuum pump at 15.0 liters per minute, measured with a field rotometer that is calibrated against a primary standard. The samples were collected for 10.0 minutes for a total volume of 150.0 liters. As the air passes through the cassette, mold spores and other particles are impacted on a retentive surface. Samples were collected at different locations in and around the structure to provide a basis for comparison of results. The samples were packaged in non-electrostatic packaging and submitted to EMSL Analytical, Inc. by overnight mail, accompanied by an executed chain of custody. The laboratory analyzed the samples using polarized light microscopy. A pre-determined number of optical fields were examined during the microscopic evaluation. In each field, the number and type of mold particles were counted and summarized on the accompanying report.

Samples of surface dust were also collected using clear adhesive tape. After contacting the tape with surfaces in or from the structure, they are adhered to a clean microscope slide and submitted to a laboratory for analysis. This method of analysis is semi-quantitative. Using microscopic methods, the density of predominant mold genera were determined on each slide and indicated on the attached report.

Samples of mold spores in carpeting were collected using a polycarbonate filter attached to a vacuum pump. The nozzle on the filter cassette was used to sweep a demarcated area of approximately 16 square inches on the carpet selected for the sampling. The cassettes were then sealed and shipped to the laboratory for analysis by optical microscopy.

Viable mold on surfaces was sampled using swabs (International BioProducts Enviroswabs). The swabs used were sterile sponges immersed in neutralizing buffer. The swabs were used to swab an area of approximately 4 sq. inches in area, placed in their protective case, and shipped cold to the analytical laboratory. In the lab, the swabs are removed and a rinseate is added to culture medium. After incubation for approximately 6 days, any colonies observed are microscopically evaluated to determine the type and number of colony forming units. The tape, carpet vacuum, and swab samples were also analyzed by EMSL Analytical.

4.0 Results

Testing results are provided in a series of tables in the Appendix. Field data sheets and lab reports are provided in the appendix as well. The locations of samples are depicted on drawings and are also described in text of Tables 1, 2, 3, 6 & 7.

Table 1 provides results for the NO₂, SO₂, dust, ozone, formaldehyde, and CO. These samples were collected at ten sites as indicated in the table and on the drawings in the appendix. These sampling sites are referred to as S1 – S10 and were distributed throughout

the building. Nine of these sites were inside the capitol building, with a control sample (the tenth sample) collected immediately outside the building. Three samples were collected in the basement, three on the first floor, two on the second floor, and one on the third floor. These sites were selected based on occupancy patterns as well as in order to provide as representative of information as possible. Some sites were in offices while others were in common areas, although most of the common area samples were in locations that were near highly occupied (now or during the Legislative session) locations.

4.1 NO₂ Sampling

All NO₂ results were below 0.01 ppm. These results are below the applicable NAAQS standard of 0.055 ppm for a 24 hour averaging period.

4.2 SO₂ Sampling

None of the samples indicated any detectable SO₂. The approximate lower limit of the tubes' measuring range is given as 0.06 ppm. However, the manufacturer indicates that SO₂ could be observed down to 0.01 ppm. None of the samples indicated SO₂ at this level. These results are below the NAAQS standard of 0.14 ppm based on a 24 hour averaging period.

4.3 Dust Sampling

Dust samples indicated low levels of PM₁₀ and PM_{2.5} in the building. All PM₁₀ samples were below the NAAQS standard of 150 micrograms per cubic meter (ug/m³), with an average of 26 ug/m³ and a range of <10 to 50 ug/m³. The average PM_{2.5} (19 ug/m³) was also below the guideline of 50 ug/m³, and a range of <10 to 30 ug/m³. Based on variability in dust levels and the inherent error in sampling and analysis, it is reasonable to look at the average levels as an indicator of overall results. Thus, these results compare reasonably well with ambient standards. On PM_{2.5} sampling days, a road construction crew was working on the streets immediately adjacent and south of the Capitol building. The road work was raising a lot of dust which, to the extent that some of it migrated into the building, could have impacted the sample results. This would have introduced a positive bias in the results, i.e., the indicated results may be higher than on typical days.

4.4 Formaldehyde Sampling

The results of formaldehyde sampling indicated that formaldehyde levels were below approximately 0.12 ppm at all locations. There is no applicable standard for indoor levels of formaldehyde.

4.5 Carbon Monoxide Sampling

The one-hour CO measurements indicated low levels of CO were present in the building. These levels ranged from about 0.002 to 0.17 ppm, as compared to the one-hour NAAQS standard of 35 ppm.

In the eight hour CO tests, no CO was detected with an approximate detection limit of 1 ppm. These results were below the eight-hour NAAQS for CO of 9 ppm.

4.6 Ozone Sampling

Ozone samples indicated ozone levels were below 0.03 ppm at all locations. These results are below the ozone NAAQS of 0.12 ppm.

4.7 Radon Sampling

Sixteen samples of radon gas were collected in the basement of the Capitol building. The locations of the samples are indicated on the drawings in the appendix. Four additional analyses (two blanks and two duplicates) were also obtained. The samples were collected over a 48.0 hour period between August 26 – 28, 2002. Results of the radon tests are provided in Table 2. As indicated, all test results were less than the USEPA-recommended guidance value of 4.0 picocuries per liter of air (pCi/L) except for a single sample. This sample, #R10, was collected in room 6.3 and had a result of 4.3 pCi/L, slightly above the guidance level. Mr. Dennis Rudko of Cator Ruma inspected this room and found that it had no supply air, a likely explanation for the slight increased level of radon in this area. Blank and duplicate sample analyses indicated expected results.

4.8 Asbestos Material Sampling

Table 3 provides the results of additional sample analysis of suspect ACMs in the Capitol. Sample locations are indicated on the drawings in the appendix. From the data, asbestos has been found in a few materials not previously identified. These include a transite roof panel on the north side of the building, a short piece of pipe insulation in the east mechanical room, and duct insulation (paper wrap) on short sections of duct in the east and west mechanical rooms. In addition, materials identified in the previous report prepared by Chen Northern are mostly still in the building. ACM pipe insulation was observed in the hallway leading to the chiller room above the ceiling. No other ACM pipe insulation was observed above ceilings. Based on the fact that short sections of the steam condensate system still have ACM pipe insulation, it seems probable that all of the related piping was once insulated with ACM and that only small sections are still insulated with ACM at this time. However, it also seems probable that risers in wall cavities that are inaccessible are insulated with ACM in most cases. In addition, the steam condensate lines in the floor of the basement are still expected to be insulated with ACM.

There are no records of widescale abatement of the vinyl asbestos floor tiles (VAT) identified in the Chen Northern report. Based on the detail included in the Chen Northern

report and the difficulty of inspecting below existing carpet without damaging the carpet, it would be more feasible to inspect specific locations for the presence of VAT after design of new systems is complete. Also, given the modest cost implications for abatement of small areas of VAT, there is limited need for this information at this time.

Based on the prior inspection and the new findings in this report, the following types of ACM are present in the facility.

Type	Material Location
Vinyl asbestos tile	9"x9" tile in east wing of basement
Vinyl asbestos tile	12"x12" gold tile in vaults and storage rooms throughout building
Vinyl asbestos tile	12"x12" red tile in basement
Floor tile mastic	Elevator equipment room
Pipe insulation	On steam supply and condensate in basement near chiller room, pipes buried in basement floor
Pipe insulation	Possibly on risers behind walls throughout building
Pipe insulation	East mechanical room (short pieces)
Duct insulation (paper)	East and west mechanical rooms (short pieces)
Transite roofing	North entrance to basement (east of main entrance)

4.9 Asbestos Air Sampling

Table 4 provides the results of nine samples collected for airborne fibers. The sample locations are indicated on the drawings in the appendix. The generally accepted standard for background exposure in buildings is 0.010 fibers/cc air (f/cc). This standard is also the approximate detection limit for the method based on normal sample volumes. The results of all nine samples were below this guideline, ranging from <0.002 to 0.008 fibers/cc. In addition, all but one sample were close to the method detection limit. The one sample that was significantly above the detection limit was collected in Room 110. This result was confounded by the probable presence of carpet fibers in that part of the building. On the sampling day, old carpet had been removed from this room, although not during the sampling period itself. Nevertheless, since the NIOSH 7400 method is sensitive to asbestos and other fibers (including cellulose, fiberglass, carpet and other fibers), this sample was likely to be affected by the carpet removal work. By the same notion, other samples with non-zero results may reflect normal background levels of other detectable fibers in addition to possible asbestos fibers.

4.10 Lead-Based Paint Sampling

Lead-based paint was identified in the Capitol structure. Sample locations are indicated on the drawings in the appendix and results are summarized in Table 5. Approximately 170 readings of various painted surfaces were collected. Also, a few readings on varnished surfaces were also collected, because some varnishes contain lead.

The standard criteria used to define lead based paint is based on the amount of lead per square centimeter of painted surface. Using this unit, a surface is consider painted with lead based paint if it contains more than 1.0 mg lead/sq. cm. Several surfaces indicated no lead, a few surfaces indicated lead below 1.0 mg/sq. cm., some surfaces were above 1.0 mg/sq. cm, and numerous surfaces were at 9.9 mg/sq. cm or above, a very high level of lead. Based on the inspection results, no specific surfaces can be considered as never or always containing lead above the defined level. Therefore, absent additional testing of specific surfaces, all surfaces should be considered LBP.

4.11 CO2 Sampling

CO2 readings were collected at approximately 60 locations throughout the occupied portions of the building on several occasions. The results are summarized in Table 6 below. The guidance value of about 700 ppm plus ambient is approximately 1100 ppm. ASHRAE suggests that if CO2 levels in a building do not exceed this level, then the potential for buildup of indoor air contaminants is reduced and that sufficient outdoor air is also being used.

All readings with one exception were below this level. In room 14.1, a reading of 1330 ppm was obtained on 8-28-02, with a followup reading of 1170 ppm. Given the nature of this room (conference room) it is possible that the readings were taken shortly after the room was used for a meeting, although we are not aware of whether this was the case. Readings in this room on other days were within normal bounds.

4.12 Mold Sampling

Air samples results for mold spores are provided in Table 7.1 Background air samples indicated generally low levels of *alternaria*, *cladosporium*, *agrocybe/coprinus*, or unidentified spores, although the *cladosporium* on one samples was moderate in level. All of the samples collected inside the facility contained similar levels of these spores, always at low levels.

5.0 Discussion

5.1 – 5.6 Summary of AHSRAE 62 parameter testing

The parameters tested under the ASHRAE-62 guidance document included NO2, SO2, PM10, ozone, CO, and formaldehyde. Lead was not tested because, as an ambient air pollutant, its principal source (automobile emissions) has been essentially eliminated and

outdoor ambient levels are consistently well below the applicable limit. While indoor sources may be present in the Wyoming Capitol building from the presence of lead based paints, no apparent work has been performed recently that may result in elevated indoor lead levels.

USEPA and WDEQ regulates NO₂, SO₂, ozone, PM₁₀, and CO levels in outdoor air under the Clean Air Act. The applicable pollutant limits are referred to as National Ambient Air Quality Standards (NAAQS). All of the indoor levels measured were below the NAAQS for that pollutant. This is the expected situation, as Cheyenne does not violate any of the NAAQS in outdoor air and because significant indoor sources for these pollutants were not present. The purpose of the testing was principally to ensure that indoor air was not affected by polluted outdoor air or indoor sources prior to redesigning the ventilation system in the building. The data suggest that there is no reason for concern over these pollutants. Therefore, no further action is recommended.

Formaldehyde testing is also suggested by the ASHRAE-62 guideline. The primary cause of formaldehyde exposures in indoor ambient air is from indoor sources. The indoor source of formaldehyde is usually new construction or building materials such as carpet or plywood that slowly release formaldehyde when newly installed. The results of the tests indicated no significant level of formaldehyde was present. No further action is recommended with respect to this pollutant.

PM_{2.5} was also sampled in the building. The rationale for this set of tests was based on the probable future replacement of the NAAQS PM₁₀ exposure criteria by a criteria based on PM_{2.5}. The health-based reason for standard setting based on PM_{2.5} is that the smaller particulate matter can reach the gas-exchanging regions of the lung and is thought to be more closely correlated with adverse health effects than is PM₁₀. Gathering information on PM_{2.5} levels was appropriate considering the life cycle and cost of a new HVAC system.

5.7 Radon Sampling

The possibility of elevated radon levels in the lower level of the building is suggested by the sample R10. In this area, the higher radon level may be caused by lack of ventilation. At the same time, most of the data from the short-term tests indicated low levels of radon.

The limitations of this test method include that fact that a short-term test is biased by the highly variable nature of radon levels in buildings. Furthermore, the test could not be conducted during closed building conditions, as would occur during the cold season. Long-term tests are recommended to confirm or to counter-indicate positive short-term test results. Long term tests address the limitations of short-term tests in terms of variable radon levels and are consequently much more accurate. We therefore recommend that a set of long-term tests be conducted, preferably during the cold season.

5.8 Asbestos Material Sampling

Asbestos containing materials identified so far in this building include vinyl asbestos floor tile, floor tile mastic, pipe insulation, duct paper wrap, and transite (See table in section 4.8). Due to constraints on intrusive sampling, there is a significant possibility that additional pipe insulation is present in inaccessible locations, primarily above hard ceilings and behind walls. There are two approaches that could be used to prevent inadvertent disturbance of these materials during future construction:

1. After construction design is complete, but prior to construction, a targeted inspection of the locations where wall or ceiling demolition will occur can be performed. This will leave intrusive sampling damage in those areas for the time between sampling and actual construction.
2. Additional inspection can be phased into the construction process such that the inspection (and any necessary abatement) will be performed just prior to construction-related demolition, so as to minimize the interval between demolition and re-construction.

Due to the limitations in sampling inaccessible locations, one of these two methods or another equivalent method will be necessary prior to the renovation project.

Any future construction should be planned with an asbestos project designer on the design team. The asbestos project designer will assist with making the determination whether asbestos materials will be impacted and the appropriate abatement method for controlling fibers.

The conceptual plans for different possible renovations of the heating and cooling systems will likely impact some of the known ACMs in the building. Based on our current understanding of the different design options, abatement cost should not be high. If minimal ACM on piping is impacted, abatement cost of limited piping and flooring should be in the \$10,000 to \$20,000 range. If ACM on piping in walls or above ceilings is impacted, an additional cost in the range of \$30.00 per lineal foot could be anticipated.

5.9 Asbestos Air Sampling

All results were below the applicable guideline. No further action is warranted at this time. However, if asbestos materials are inadvertently disturbed in the future (greater than 3 square or lineal feet), air sampling should be used to help determine if an exposure potential exists. Also, if any planned abatement activity is performed, air sampling should be conducted during and after the work to ensure that fiber levels are adequately controlled.

5.10 Lead-Based Paint Sampling

Due to the high levels of lead in some paints, disturbance of lead during construction should be minimized. If activities such as minor drilling into walls is performed, this can be accomplished with "lead-safe" work practices, which involves using a contractor who is aware of the presence of lead based paint, will use methods that do not involve generating

significant amounts of dust, and can clean up small amounts of dust as it is generated. Air monitoring can be conducted to verify that dust generation is at acceptable levels.

If significant dust generating activities are planned, it is preferable to use a deleading contractor to remove lead-based paints that other contractors will impact. If this expense is warranted, additional lead sampling in the specific areas that will be impacted is the most economical method of minimizing abatement costs.

On-going operations of the building should be conducted to minimize any significant generation of dust from painted surfaces.

5.11 CO2 Sampling

Based on the CO2 data produced, indoor air quality should not be adversely impacted by lack of ventilation. However, the fact that this monitoring was performed in a warm season and when the state legislature is not in session suggests that the data may not be representative of levels during the legislative session. If CO2 monitoring could be performed when the legislature was meeting, additional information that may help to guide a detailed design of the new systems could be collected.

5.12 Mold Sampling

There are no Federal or Colorado State standards or guidelines for acceptable mold counts inside buildings at this time. Therefore, the assessment of mold concerns relies on relative measurements of mold in buildings. Air inside a facility is inevitably greatly influenced by the air outside due to natural and engineered processes that move outdoor air into the building. Therefore, the mold counts inside the building are directly affected by the counts in the outdoor environment but are not necessarily the same. For this reason, indoor counts that are in the range of the outdoor counts are not considered to be an adverse finding. Indeed, due to the inherent variability of the air in buildings as well as the sampling and analytical method, indoor air or surface counts that are modestly above outdoor counts may not constitute an adverse condition.

6.0 Recommendations

The following specific recommendations are a list of recommendations described in Section 5.

1. Long-term radon testing is recommended. This should commence at such time so that data would be available early in the design phase, but will also preferably cover some of the cold winter months.
2. Design of the new ventilation system should include an assessment of ACMs that will be impacted, design of abatement work (if necessary), and additional sampling or inspection as needed in specific locations.
3. Existing ACMs should not be disturbed prior to abatement at some point in the future. Prior to abatement, they should be managed in-place.

4. All ACMs that will be impacted by the renovation should be properly abated early in the construction process.
5. Depending on the nature of the construction work to be performed, lead-based paints should be handled using "lead-safe" work practices by various contractors, or removed by a qualified abatement contractor.
6. Disturbance of paint within the building should be minimized prior to abatement.
7. Specific locations of LBPs should be identified in a targeted LBP survey prior to abatement scoping if significant impacts will occur during construction.
8. CO2 measurements should be collected when the legislative session is in progress to determine CO2 levels during high building occupancy.

Disclaimer

As with any visual observation or conclusions made based on random and limited sampling, there is an inherent possibility that undetected contamination exists, and CEH does not accept liability for any not reasonably ascertainable from the data or observations made. No evaluations beyond those described in the report have been made and CEH is not responsible for any hazards or risks, apparent or otherwise, other than those included in this evaluation. Sampling can be inherently obtrusive, and CEH does not accept liability for any damage to the property reasonably occurring during the course of the work in connection with its duties. The only warranty expressed or implied is that the work conforms to standard industry practice at the time it was performed. In the unlikely event a defect in the work is noted, the client has the option to request that the defect be remedied at no additional cost, or a pro rata deduction in the fee billed. CEH's maximum liability to any party shall not exceed the fee for the defective portion of the work. Any reports issued are for the sole use of the client and reliance on it by others is at their sole risk.

VI. Constructability Issues



VI. CONSTRUCTABILITY ISSUES

1. APPROACH

Personal interviews were conducted with representatives from each of the agencies housed in the State Capitol, as well as representatives from State Facilities Management. The purpose of the interviews were to inform the occupants of the proposed project and to take input from them regarding heating, cooling and ventilation concerns, logistical considerations regarding undertaking a project of this nature in the Capitol Building and their agency's yearly schedule as it would be impacted by this project. In addition, each room in the Capitol building was reviewed to verify floor plan and interior finishes. Refer to the attached plans.

2. LOGISTICS

Nature of the Project

This project will be "vertical" in nature rather than "horizontal." In other words, the majority of the piping and ductwork that will need to be installed will run vertically through the building. This is an important consideration when determining how to phase the project. It will be more efficient if the contractor can work through all levels of the building in one area at a time.

Swing Space

As the work of this project progresses, it will be necessary for the contractor to work in many of the rooms throughout the Capitol Building. Some rooms will only see replacement of exposed piping. Other areas may see removal of existing wall and ceiling finish material in order to expose concealed piping. At other locations, new chases may need to be built to conceal new ductwork. The extent to which the work of Capitol Building personnel is disrupted is yet to be determined. However, it can be reasonably anticipated that personnel will need to be displaced from their permanent offices for a certain period of time for the contractor to accomplish the work. As the logistics and scheduling are worked out, it is also anticipated that entire departments will be relocated together and all work within their spaces will take place at one time.

With office space in the Capitol complex at a premium, it is necessary to identify a list of options for temporary office space for displaced Capitol Building personnel. Following is a preliminary list of options. For purposes of this report, the temporary space where workers or departments are relocated will be termed "Swing Space." Options for swing space are as follows:

- Do not provide any swing space – require that the contractor work around personnel in their office with only minor relocation of furniture and small temporary dust enclosures.
- Lease office space outside the Capitol complex.
 1. If Safeway proceeds with building a new downtown store, purchase or lease their existing building and utilize it for the duration of the project.
 2. If St. Mary's Catholic School proceeds with building a new school, purchase the existing St. Mary's School and Convent and utilize those buildings during the duration of the project.
 3. Secure additional lease space at the previous Wards Building.
 4. Secure additional lease space at the U. S. West Building.
 5. Lease the existing St. Mary's Gymnasium Building from United Medical Center.
 6. Lease the Federal Highway Administration Building.
- Provide modular office buildings adjacent to the Capitol Building.
- If one agency is being considered for permanent relocation outside the Capitol Building (Attorneys General?), advance that transition to allow their existing space to be used as swing space.
- Relocate one department out of the building for the duration of the project (two to three years) and use their space as swing space.
- Utilize offices and meeting rooms in the Second and Third Floors, East and West Wings of the building.
- Remove the existing legislator's desks from the Senate and House Chambers, install temporary partitions and utilize those spaces.
- If a new facility is approved for the Department of Criminal Investigation, utilize the existing Rogers Building.
- Renovate the Emerson Building Auditorium to allow temporary office space.
- Provide temporary offices in the First Floor East and West Wing Corridors.

After interviewing representatives from the various agencies housed in the Capitol Building, and reviewing the list of options for swing space, our recommendation is as follows:

- Utilize office and meeting rooms in the Second and Third Floors, East and West Wings of the building.
 1. Coordinate with LSO
 2. Relocate agencies to the opposite end of the building from their permanent location. This will allow the contractor to work "vertically" through all five levels of the building with piping and ductwork.

To coordinate and schedule the phasing of the project, we will prepare graphic plans that show the Work Areas for certain time frames. Those plans will also

indicate where the agencies affected will be temporarily relocated. Refer to the sample Work Plan.

Building Code Issues

On projects that involve renovation of existing buildings, one must give consideration to correcting existing fire and life safety related deficiencies. Depending on the type and extent of the renovation work, it may be prudent to include with the project, and the Building and Fire Officials may have the prerogative to require, correction of fire and life safety deficiencies. Such is the case with this project. The Capitol Building is a beautiful historic building. However, there are known to be several fire and life safety issues. They include:

1. Partial unprotected wood frame construction;
2. Lack of a fire sprinkler system;
3. Lack of a complete fire alarm system;
4. Unprotected atrium condition at the rotunda;
5. Non-rated wall, ceiling and door assemblies at exit corridors;
6. Incomplete exit signage; and
7. Maximum occupancy not posted in assembly areas.

In two review meetings and a subsequent inspection of the Capitol Building, the Building and Fire Officials outlined the existing fire and life safety issues that they will require be corrected as part of this project. Those issues are generally described as follows:

1. A fire sprinkler system shall be installed throughout the building;
2. A complete fire alarm system shall be installed throughout the building;
3. Exit signage shall be installed at certain locations; and
4. Maximum occupancy shall be permanently posted in assembly areas.

The Building and Fire Officials have indicated that the installation of the fire sprinkler and fire alarm system will adequately mitigate other more difficult issues such as the partial unprotected wood frame construction, unprotected atrium condition at the rotunda and the non-rated wall, ceiling and door assemblies at exit corridors.

Project Work Space

during the course of the project, it will be necessary to provide office/coordination space within the Capitol grounds. This space will be utilized by the contractor's consultants and State General Services' personnel as office, meeting and coordination space and will provide a central location for project coordination and dissemination of information. It has been suggested that the space in the concourse between the Capitol Building and the Herschler Building that is

traditionally leased to the Capitol Club be set aside during the project for the above-described purpose.

Conference/Meeting/Hearing Rooms

Rooms 302 and 204 in the capitol Building have traditionally provided large Meeting/Conference Room accommodations for legislative hearings throughout the course of the year. If these spaces are made part of swing space, it is suggested that Herschler Building Rooms 1299 and 1699 be set aside to replace those functions.

Dust Protection

It is anticipated that dust protection will be required and that contractors will need to take a "back staircase" to go from floor-to-floor. The dust protection will keep dust from entering the Main Building corridors to seal the construction zone.

Equipment Access to the Attic

Due to the type of roof and limited elevator access, a crane will be required to bring mechanical equipment into the attic. Primarily, this equipment would consist of new air-handling units, which could be brought in within a few days.

Temporary Heat

The proposed construction schedule of mid March through the end of May will mean that temporary heat may be required. It is expected small electric heaters will suffice.

VII. Conclusions/ Recommendations



VII. CONCLUSIONS/RECOMMENDATIONS

1. CONCLUSIONS

Steam Condensate Pipe

Due to age and the type of system, it is not unusual for steam condensate pipe to leak. This system has served in excess of eighty (80) years. It is expected that it will continue to leak particularly on horizontal runs. The leaks will cause water damage in areas that are inaccessible, which means the damage could be far reaching.

Mechanical Ventilation

The Facilities staff has decided to keep the windows closed due to security concerns. In general, operable windows provide ventilation to perimeter spaces. This type of ventilation system works well during temperate conditions. During inclement weather or extreme temperature conditions, operable windows are not always the best choice for providing ventilation. When operable windows are no longer used for ventilation, it is required to provide mechanical ventilation.

Cooling Coil Condensate Pipe

The cooling coil condensate piping system in the Supreme Court and State Library Building is leaking and clogging causing water problems throughout the building. This situation is not uncommon with systems this old. Some pipe elbows in the fan coil units contribute to the clogging.

Mechanical Equipment

In both buildings the fan coil units, which provide the majority of the heating and cooling, are beyond their estimated median service life. The chiller plant has three (3) chillers that will be beyond their estimated median service life within ten years. The boiler plant will need to replace boilers within twenty years.

Miscellaneous Findings

In the basement of the State Capitol, there is a Locker Room that has no ventilation. The Locker Room also had the highest recorded radon level.

The main hall of the building has no ventilation or cooling. Per discussions with Maintenance personnel, this has not caused any problems. Ventilation is required by code. Most of the time there are not a lot of people in the main hall. When the AHUs are replaced, additional capacity for ventilation purposes only can be added, as well as supplemental ductwork to serve the main hall.

2. RECOMMENDATIONS

Steam Condensate Pipe

Due to the nuisances associated with the leaking steam condensate pipe in the Capitol Building, it should be replaced. Leaks are occurring at threaded joints (thinnest portion of the pipe) and due to the type of system, continual leaks are expected. The steam condensate pipe can be replaced or the entire steam and steam condensate system can be replaced with the same system or a heating hot water system.

It is recommended to replace both the steam and steam condensate because they are located in the same areas of the building. Once this work is complete, these areas would not need to be disturbed for another twenty to thirty (20-30) years.

Mechanical Ventilation

Once the operable windows are locked closed, mechanical ventilation is required. Adding mechanical ventilation in the Capitol Building will be costly, however, there are two (2) approaches. The approaches are as follows:

1. Replace air-handling units (AHUs) in the attic and two AHUs in the basement redistribution ductwork to all spaces in the building. This would be a dedicated ventilation system. The distribution air would be tempered, however, spaces previously heated and cooled by the AHUs would need fan coil units.
2. Replace AHUs identified in Recommendation 1 with larger AHUs capable of serving current areas, as well as spaces with no mechanical ventilation.

Supreme Court and State Library Building – Condensate Pipe

Due to the nuisances of the leaking cooling coil condensate pipe in the Supreme Court Building, replacement of condensate pipe throughout from the fan coil units to the drain in the basement is recommended.

VIII. Construction Cost Opinion



**WYOMING STATE CAPITOL BUILDING
Condensate Replacement
Construction Cost Opinion Summary**

Recommended Approach:

Heating hot Water System	\$1,550,000
Fan Coil Unit Replacement	1,940,000
Ventilation System	1,440,000
Fire Protection System	753,000
Fire Alarm System	<u>457,000</u>
Total	\$6,140,000

Option 1:

Steam and Steam Condensate Replacement	\$1,440,000
Fan Coil Unit Replacement	1,940,000
Ventilation System	1,440,000
Fire Protection System	753,000
Fire Alarm System	<u>457,000</u>
Total	\$6,030,000

Option 2:

Condensate Replacement	\$ 575,000
Fire Protection system	753,000
Fire Alarm System	457,000
Ceiling Removal	<u>200,000</u>
Total	\$1,985,000

Supreme Court and State Library Building Cooling Coil Condensate Pipe Replacement	\$120,000
--------------------------------------------------------------------------------------	-----------

CATOR, RUMA & ASSOCIATES, CO.

DATE PREPARED: 10/14/02

SHEET 2 OF 7

OPINION OF PROBABLE CONSTRUCTION COSTS

PROJECT: Wyoming State Capitol Building
Condensate Replacement

BASIS:

☐ No Design
☐ Prelim. Design
☐ Final Design
☐ Other _____

LOCATION: Cheyenne, Wyoming

PREPARED BY: Dennis F. Rudko

REFERENCE DRAWING NO.:

CHECKED BY:

SUMMARY	QUANTITY		MATERIAL		LABOR		TOTAL COST
	NO. UNITS	UNIT	PER UNIT	TOTAL	PER UNIT	TOTAL	
Steam and Steam Condensate Replacement Cost							
Steam Piping Replacement	1	Job					\$ 340,000
Dust Protection, Cut and Patch	1	Job					\$ 210,000
Protection of Existing, Shift Work, Historical Building							
Ceiling Removal, Painting	1	Job					\$ 108,000
Design Fee	1	Job					\$ 94,000
Safety Factor 20%							\$ 188,000
						Total	\$ 940,000
Condensate pipe Replacement							\$ 500,000
(See Summary Previous Page)							
						Grand Total	\$1,440,000

CATOR, RUMA & ASSOCIATES, CO.

DATE PREPARED: 10/14/02

SHEET 3 OF 7

OPINION OF PROBABLE CONSTRUCTION COSTS

**PROJECT: Wyoming State Capitol Building
Condensate Replacement**

BASIS:

☐ No Design
☐ Prelim. Design
☐ Final Design
☐ Other_____

LOCATION: Cheyenne, Wyoming

PREPARED BY: Dennis F. Rudko

REFERENCE DRAWING NO.:

CHECKED BY:

[illegible]

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**CATOR, RUMA & ASSOCIATES,
CO.**

DATE PREPARED: 10/14/02

SHEET 5 OF 7

OPINION OF PROBABLE CONSTRUCTION COSTS

**PROJECT: Wyoming State Capitol Building
Condensate Replacement**

BASIS:

☐ No Design
☐ Prelim. Design
☐ Final Design
☐ Other _____

LOCATION: Cheyenne, Wyoming

PREPARED BY: Dennis F. Rudko

REFERENCE DRAWING NO.:

CHECKED BY:

SUMMARY	QUANTITY		MATERIAL		LABOR		TOTAL COST
	NO. UNITS	UNIT	PER UNIT	TOTAL	PER UNIT	TOTAL	
Ventilation Cost							
AHUs – 42,000 cfm		\$5/cfm					\$ 210,000
Dust Protection, Cut and Patch	1	Job					\$ 180,000
Protection of Existing, Shift							
Work, Historical Building							
Chilled Water Piping	1	Job					\$ 100,000
Exhaust Fans and Duct	1	Job					\$ 50,000
Ventilation Duct	1	Job					\$ 100,000
Ceiling Removal, Shafts, Painting, Etc.	1	Job					\$ 250,000
Additional FCUs	1	Job					\$ 200,000
Design Fee	1	Job					\$ 110,000
Safety Factor 20%							\$ 240,000
						Total	\$1,440,000

CHECKED BY:

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IX. Capitol Building Department Zoning



PENTHOUSE

AREA OF
WORK

THIRD FLOOR

AREA OF
WORK

SECOND FLOOR

AREA OF
WORK

FIRST FLOOR

AREA OF
WORK

BASEMENT

AREA OF
WORK

● CONSOLIDATE LSO TO AVAILABLE SPACE
IN OTHER AREAS OF SECOND AND THIRD
FLOORS

● RELOCATE SECRETARY OF STATE AND A
PORTION OF ATTORNEY GENERAL TO
SECOND AND THIRD FLOOR EAST

STATE OF WYOMING
CAPITOL CONDENSATE
REPLACEMENT PROJECT

Project Number:
02.2.048
Date Issued: Date Revised:

Sheet Title:
EXAMPLE
OF
SCHEDULE

Sheet Number:
C 2.0

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WORK PLAN -
MAY 1 THRU JUNE 30, 2003

NTS

C 2.0

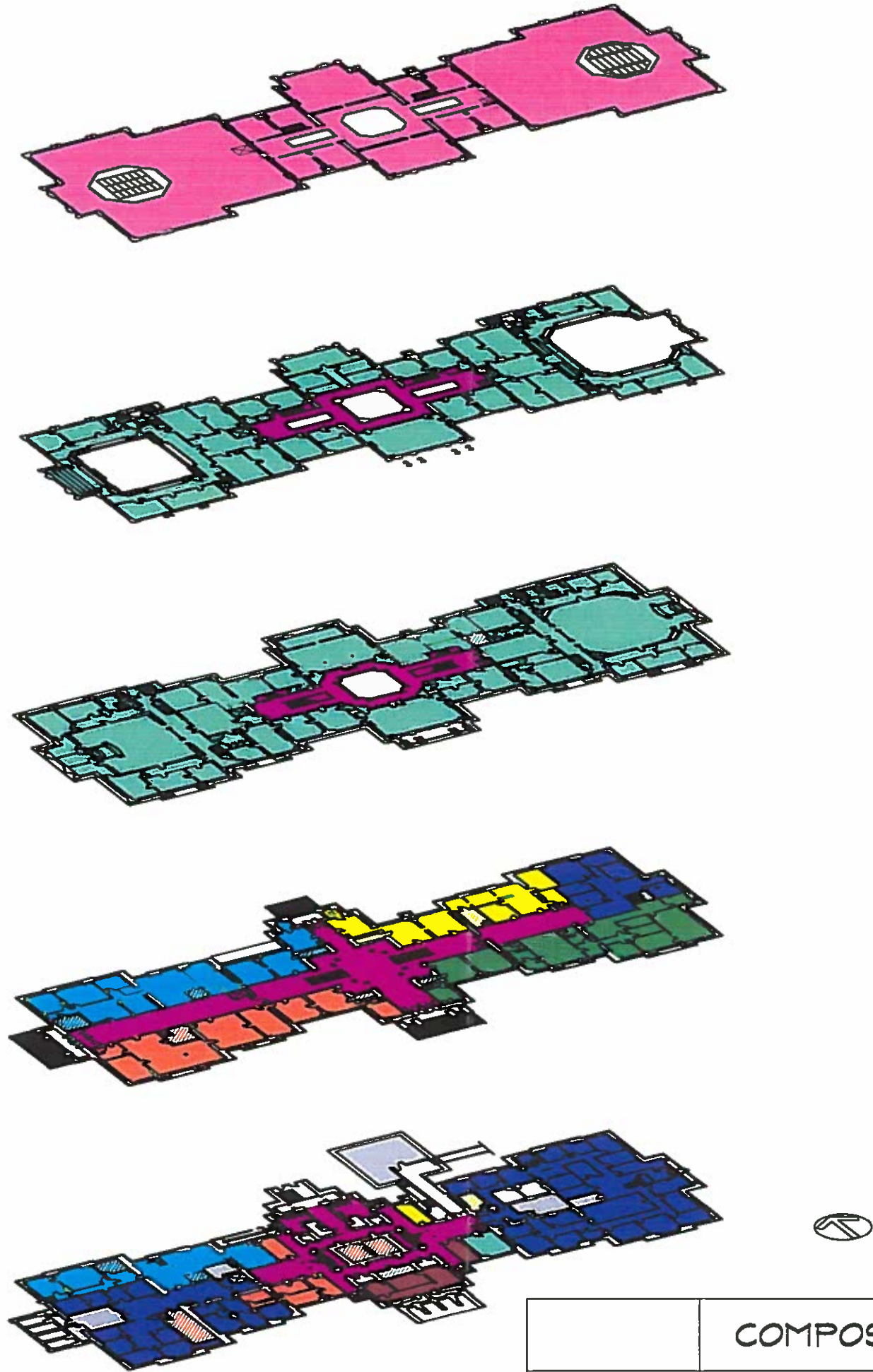
PENTHOUSE

THIRD FLOOR

SECOND FLOOR

FIRST FLOOR

BASEMENT



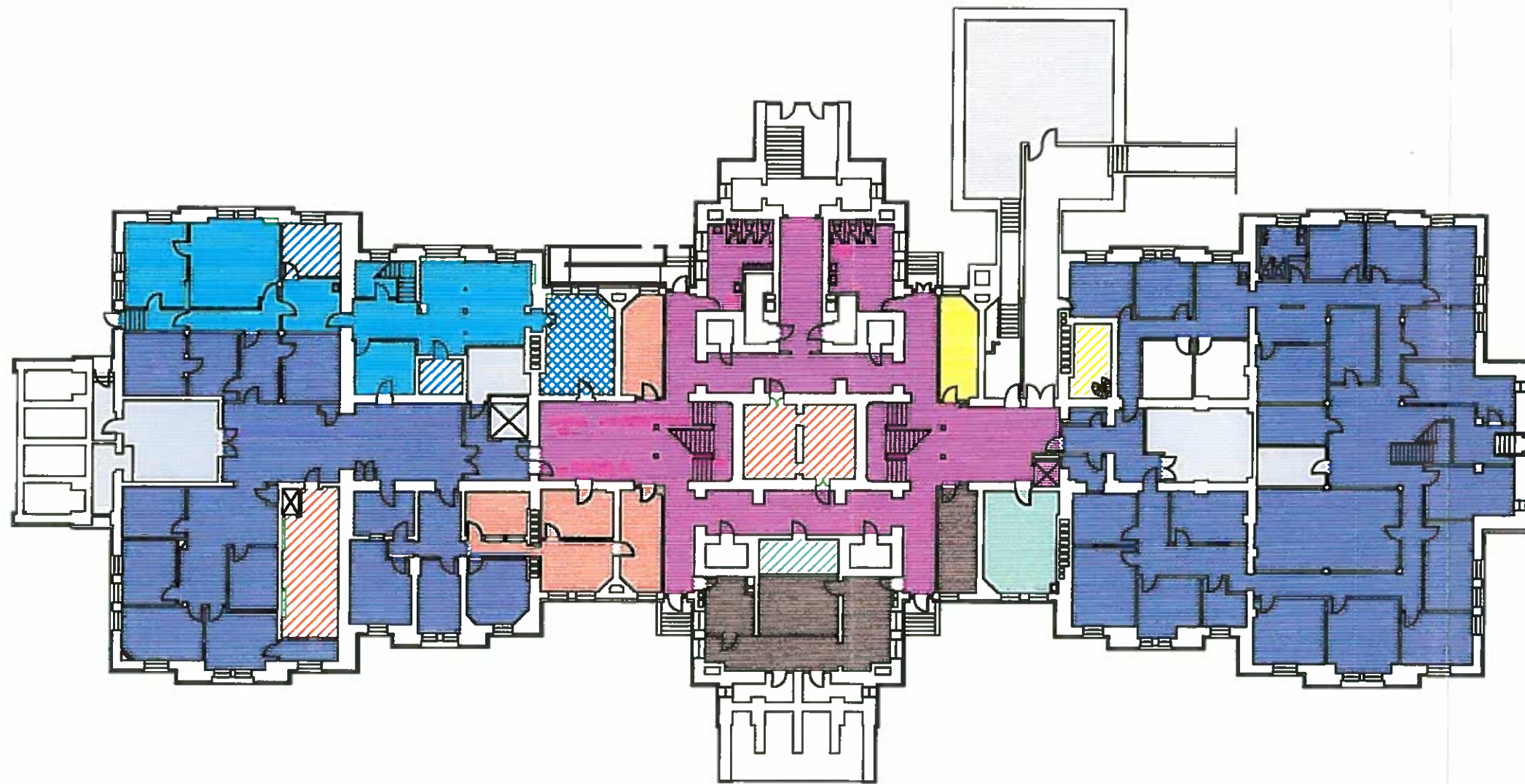
COMPOSITE FLOOR PLANS

NTS	C 2.1
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STATE OF WYOMING
CAPITOL CONDENSATE
REPLACEMENT PROJECT
Cheyenne, Wyoming

Project Number:	02.2.048
Date Issued:	Date Revised:
Sheet Title:	STACKED COMPOSITE FLOOR PLANS
Sheet Number:	C 2.1

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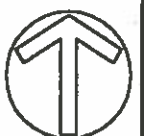
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	SECRETARY OF STATE		FACILITIES MANAGEMENT		CONFERENCE (COLORS VARY ACCORDING TO DEPT.)
	AUDITOR		PUBLIC SPACES		VAULT (COLORS VARY ACCORDING TO DEPT.)
	TREASURER		PENTHOUSE		
	ATTORNEY GENERAL		MECHANICAL		
	GOVERNOR				
	LEGISLATIVE SERVICES OFFICES				

BASEMENT FLOOR PLAN

1"=30'-0"

C 3.0



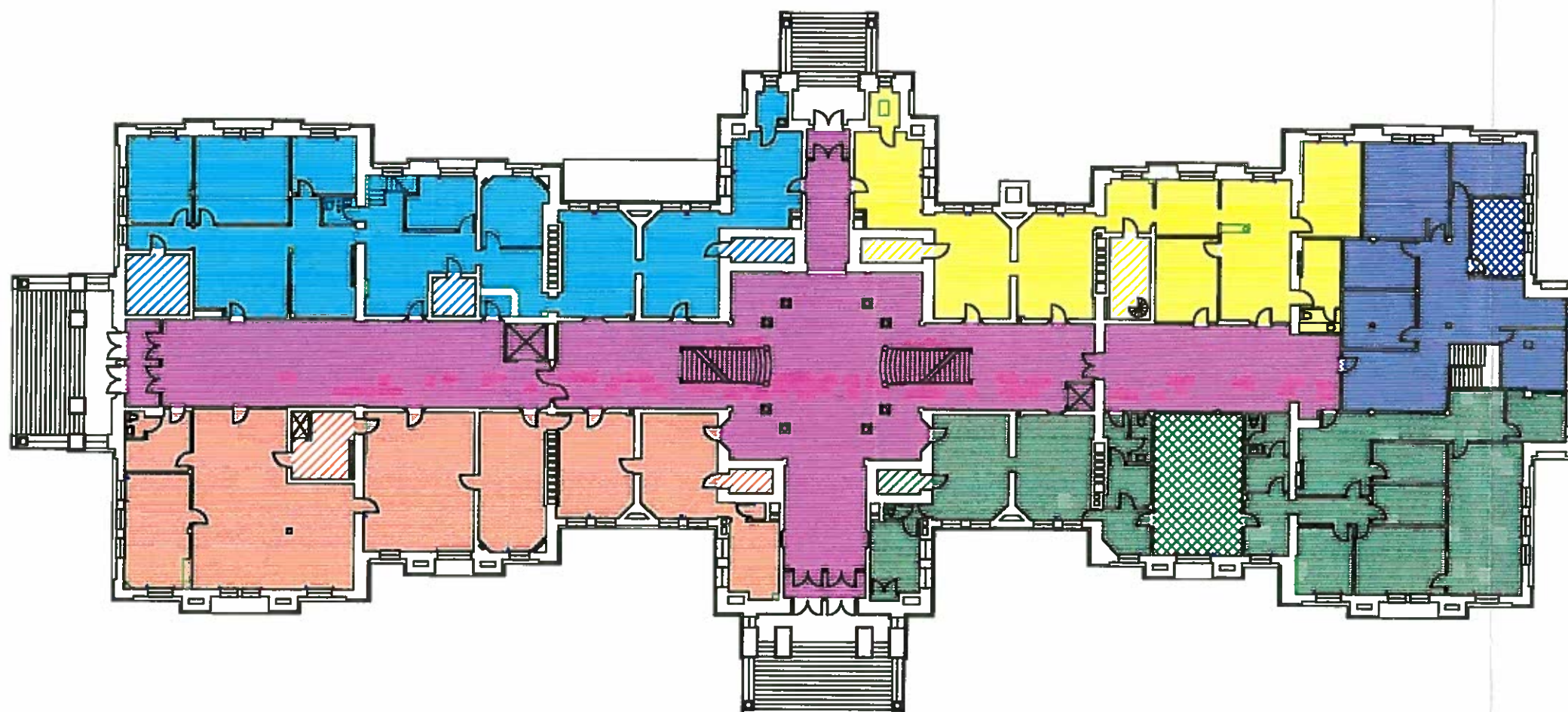
STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT Cheyenne, Wyoming

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02.2.048
Date Issued: Date Revised:
Sheet Title:

BASEMENT
FLOOR PLAN

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	TREASURER		PENTHOUSE		
	ATTORNEY GENERAL		MECHANICAL		
	GOVERNOR				
	LEGISLATIVE SERVICES OFFICES				

FIRST FLOOR PLAN

1"=30'-0"

C 3.1



STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT

Cheyenne, Wyoming

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02.2.048
Date Issued: Date Revised:

Sheet Title:

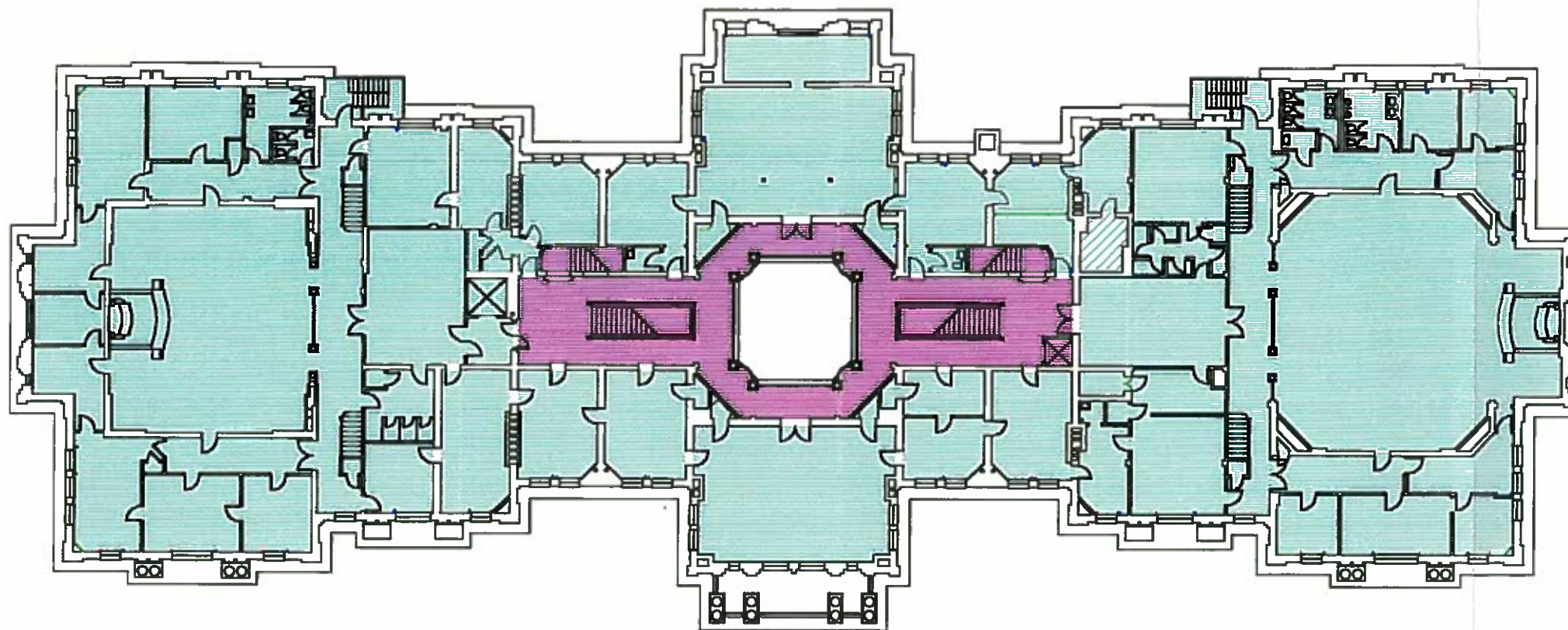
FIRST
FLOOR PLAN

Sheet Number:













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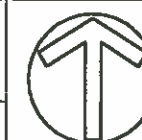
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	AUDITOR		PUBLIC SPACES		VAULT (COLORS VARY ACCORDING TO DEPT.)
	TREASURER		PENTHOUSE		
	ATTORNEY GENERAL		MECHANICAL		
	GOVERNOR				
	LEGISLATIVE SERVICES OFFICES				

SECOND FLOOR PLAN

1"=30'-0"

C 3.2



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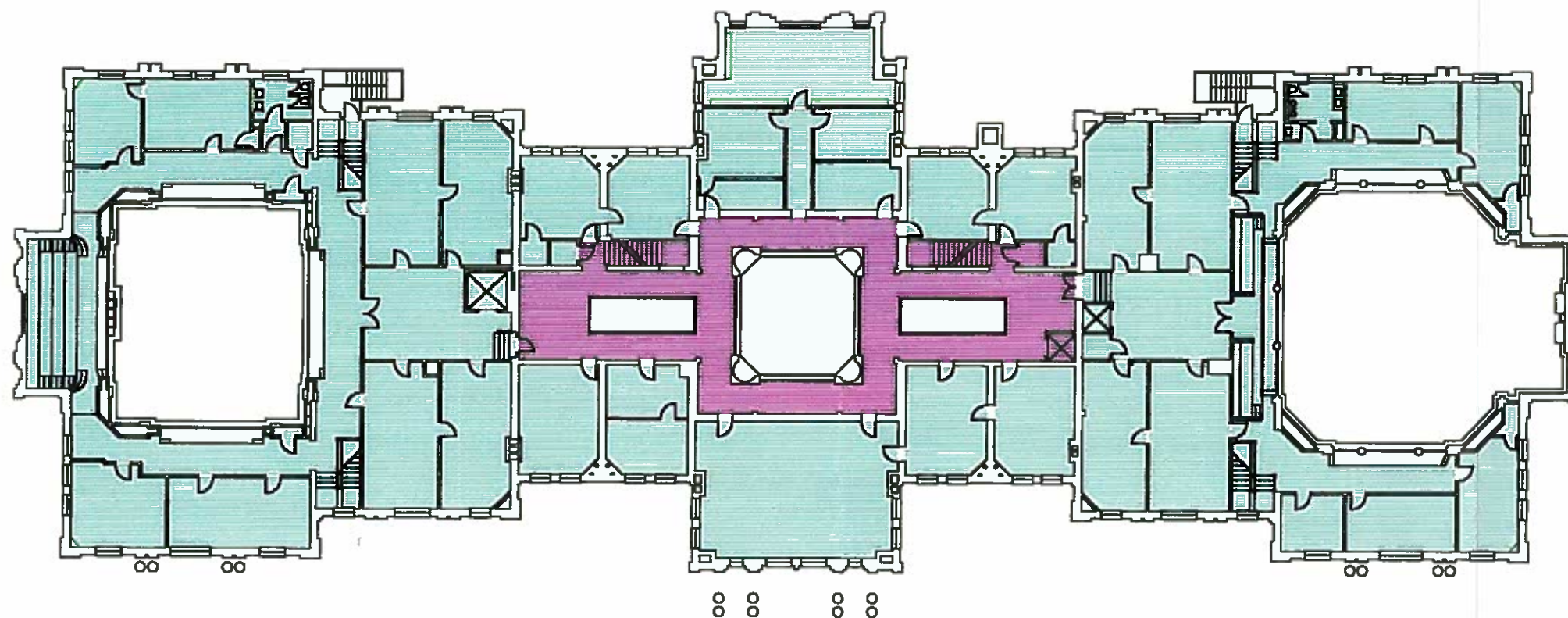
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SECOND FLOOR PLAN

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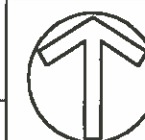
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	AUDITOR		PUBLIC SPACES		VAULT (COLORS VARY ACCORDING TO DEPT.)
	TREASURER		PENTHOUSE		
	ATTORNEY GENERAL		MECHANICAL		
	GOVERNOR				
	LEGISLATIVE SERVICES OFFICES				

THIRD FLOOR PLAN

1"=30'-0"

C 3.3



STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT

Cheyenne, Wyoming

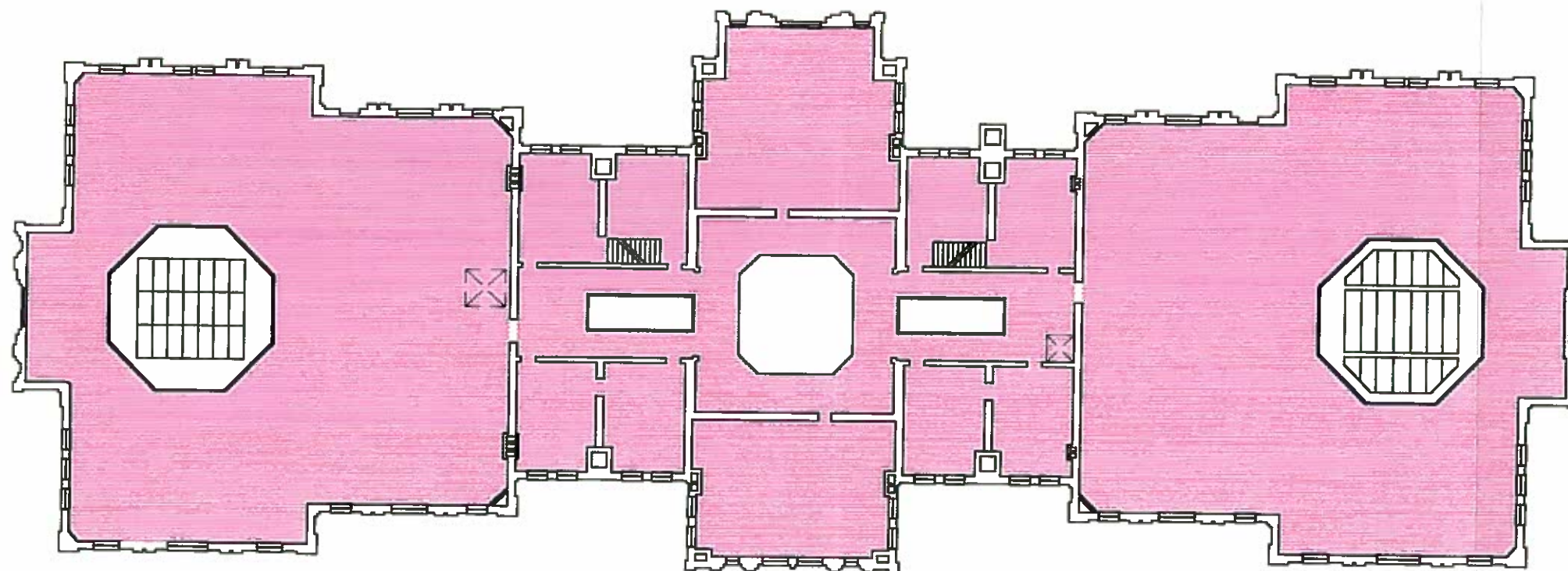
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THIRD
FLOOR PLAN

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	TREASURER		PENTHOUSE		
	ATTORNEY GENERAL		MECHANICAL		
	GOVERNOR				
	LEGISLATIVE SERVICES OFFICES				

PENTHOUSE FLOOR PLAN		
1"=30'-0"	C 3.4	

STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT

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Sheet Title:

PENTHOUSE
FLOOR PLAN

Sheet Number:
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X. Capitol Building Occupancy Schedule



COMPOSITE SCHEDULE
2002.09.18



Legend

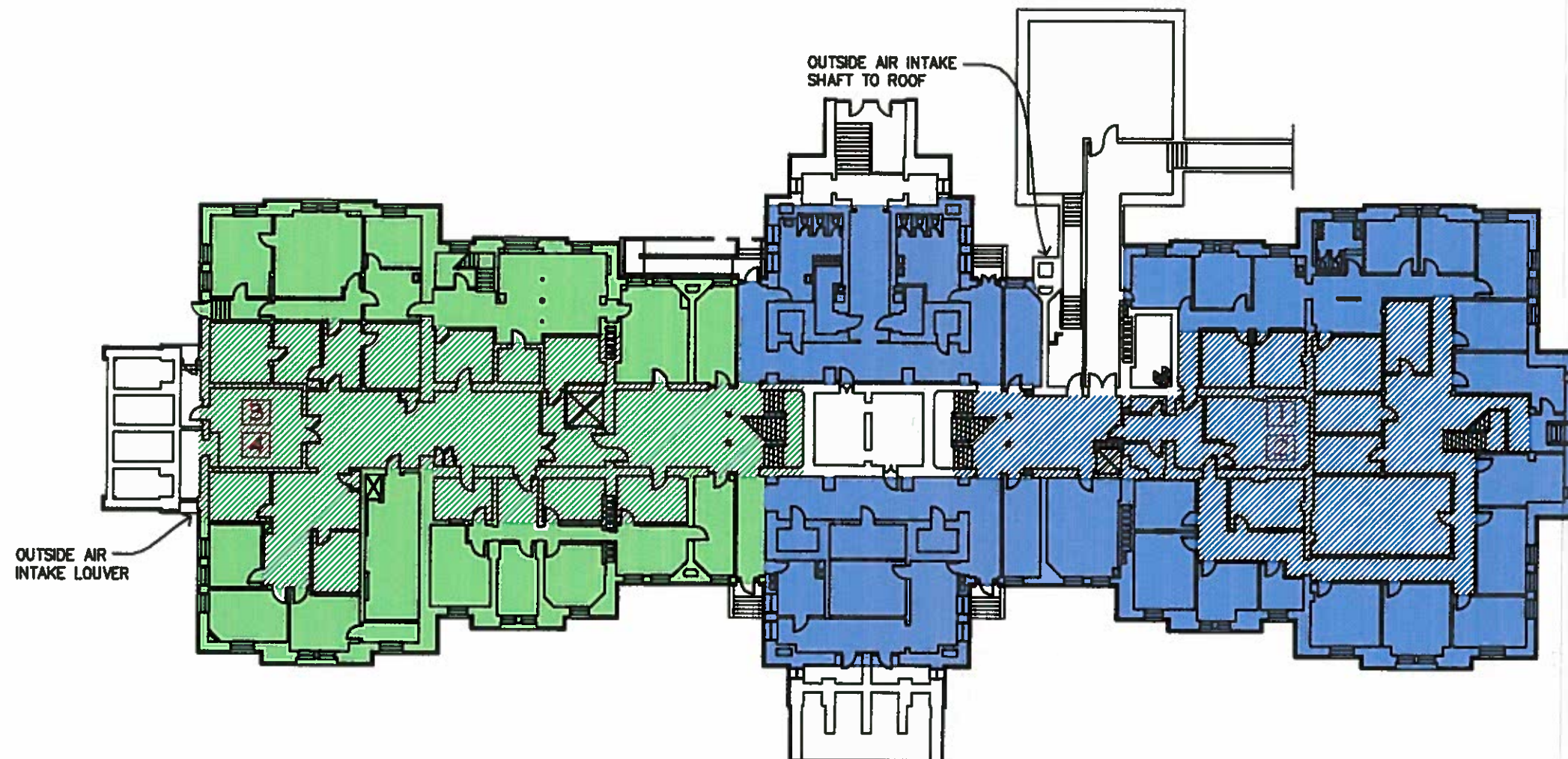
Agency Cannot Be Disrupted

Work May Take Place With Some Considerations

Preferred Time Frame For Work To Take Place

XI. Capitol Building Mechanical Ventilation Zones





HVAC SYSTEM ZONE LEGEND

- | | | | |
|---|-----------------------------------------|---------------------|-------------------------|
| 1 | AHU SERVING BASEMENT & 1ST FLOOR (EAST) | [Solid Blue Box] | AHU ADDITIONAL COVERAGE |
| 2 | AHU SERVING HOUSE CHAMBERS | [Diagonal Hatching] | AHU CURRENT COVERAGE |
| 3 | AHU SERVING BASEMENT & 1ST FLOOR (WEST) | [Solid Green Box] | AHU ADDITIONAL COVERAGE |
| 4 | AHU SERVING SENATE CHAMBERS | [Diagonal Hatching] | AHU CURRENT COVERAGE |

BASEMENT MECHANICAL PLAN

1"=30'-0"



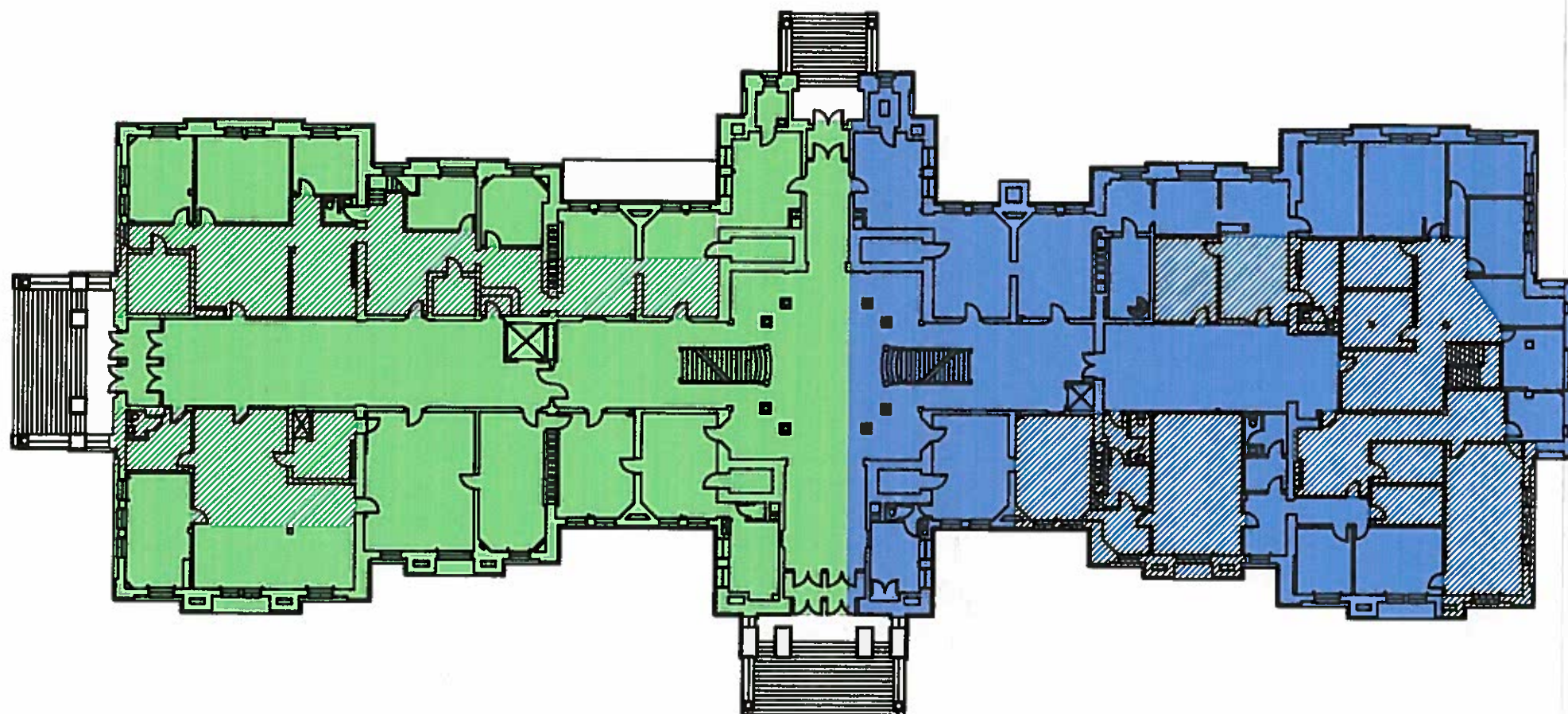
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Project Number: C02-096
 Date Issued: 10-11-02
 Sheet Title: BASEMENT MECHANICAL PLAN

Sheet Number: M 3.0

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 LAUREL, WYOMING 82403
 PHONE: (307) 232-0200
 FAX: (307) 232-3701
 MECHANICAL/ELECTRICAL ENGINEERS



HVAC SYSTEM ZONE LEGEND

- AHU ADDITIONAL COVERAGE
- AHU CURRENT COVERAGE
- AHU ADDITIONAL COVERAGE
- AHU CURRENT COVERAGE

AHU'S SERVING THE FIRST FLOOR ARE LOCATED IN THE BASEMENT

FIRST FLOOR MECHANICAL PLAN

1"=30'-0"



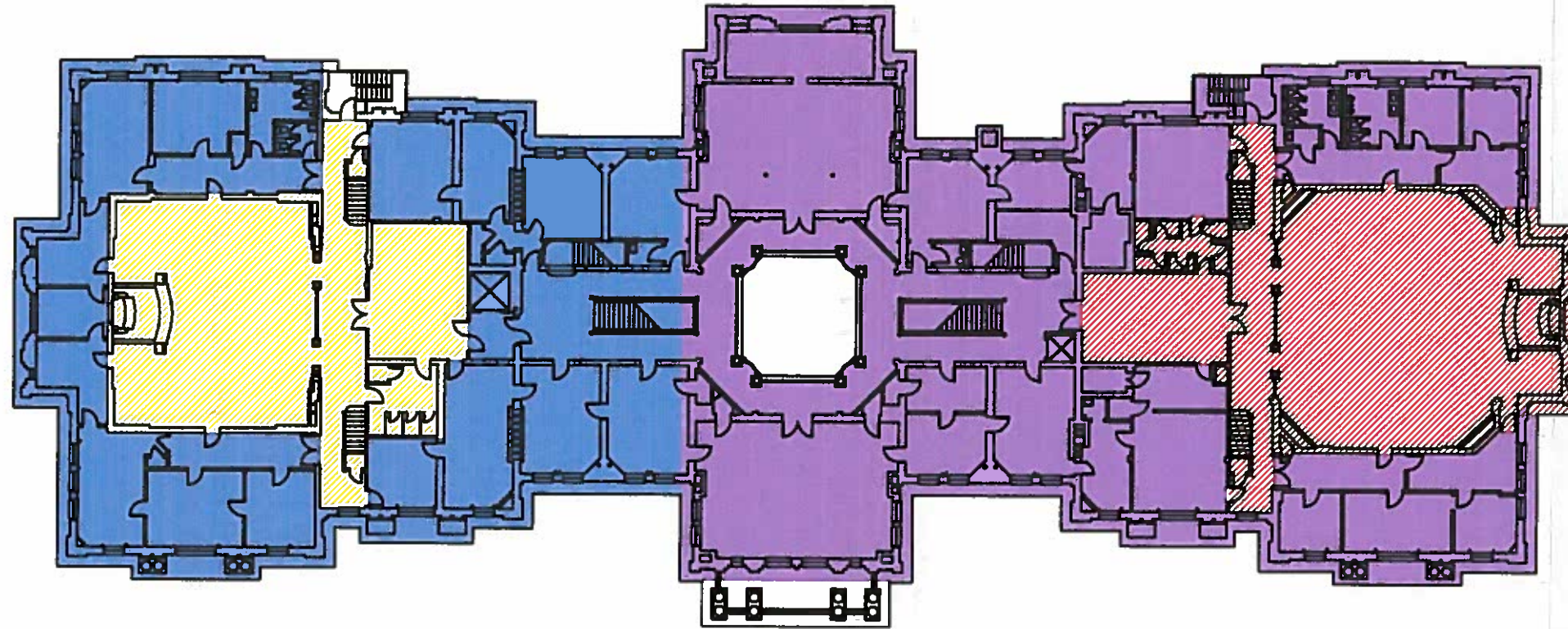
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Project Number:
C02-096
Date Issued:
10-11-02
Sheet Title:
FIRST FLOOR
MECHANICAL
PLAN

Sheet Number:
M 3.1

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LAKESIDE, CO 80403 80215
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FAX: (303) 235-5701
MECHANICAL/ELECTRICAL ENGINEERS



HVAC SYSTEM ZONE LEGEND

- AHU ADDITIONAL COVERAGE
- AHU ADDITIONAL COVERAGE
- AHU CURRENT COVERAGE
- AHU CURRENT COVERAGE

AHU'S SERVING THE SECOND FLOOR LOBBIES ARE LOCATED IN THE ATTIC.
 AHU'S SERVING THE HOUSE AND SENATE CHAMBERS ARE LOCATED IN THE BASEMENT

SECOND FLOOR MECHANICAL PLAN

1"=30'-0"



STATE OF WYOMING

CAPITOL CONDENSATE REPLACEMENT PROJECT

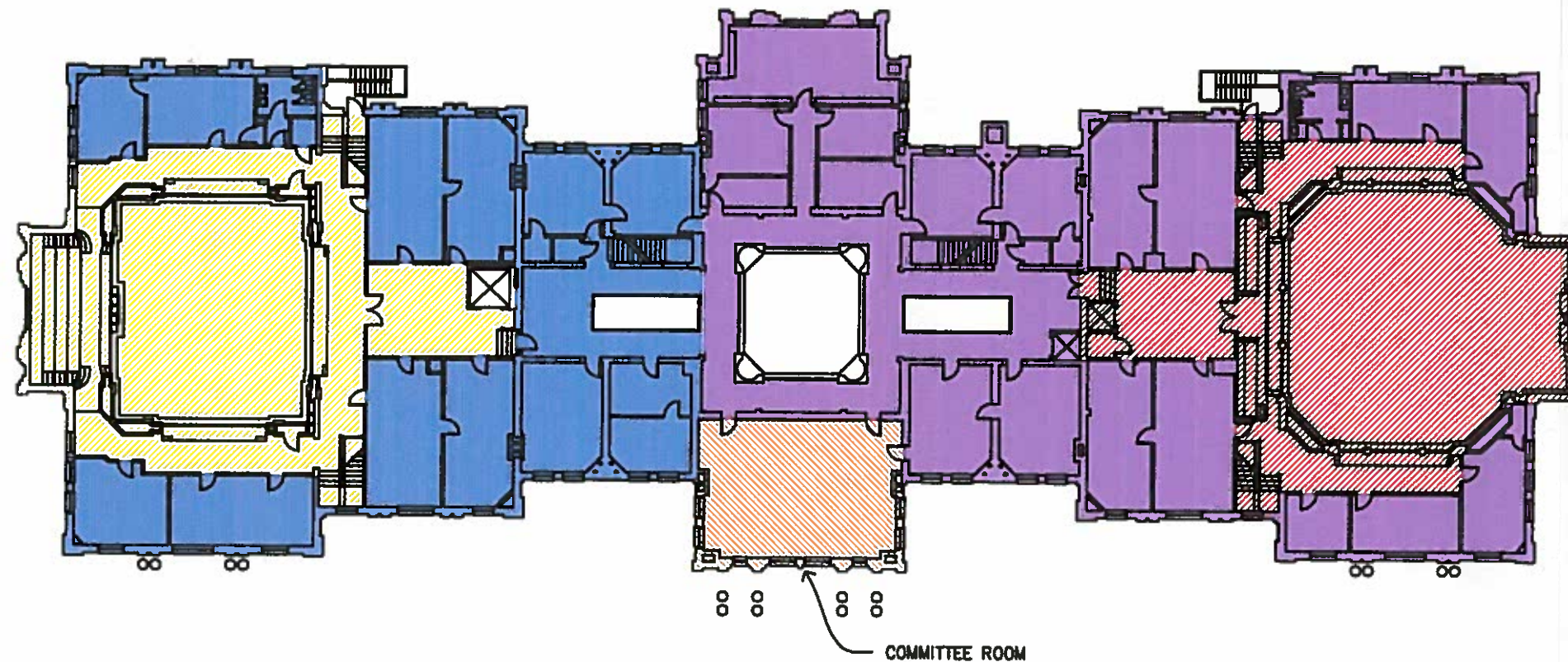
Cheyenne, Wyoming

Project Number: C02-096
 Date Issued: 10-11-02
 Date Revised:
 Sheet Title: SECOND FL. MECHANICAL PLAN
 Sheet Number:

M 3.2

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 LAKEWOOD, COLORADO 80215
 PHONE: (303) 232-8200
 FAX: (303) 232-3701
 MECHANICAL/ELECTRICAL ENGINEERS



HVAC SYSTEM ZONE LEGEND

	AHU ADDITIONAL COVERAGE		AHU CURRENT COVERAGE
	AHU ADDITIONAL COVERAGE		AHU CURRENT COVERAGE
	AHU CURRENT COVERAGE		

AHU'S SERVING THE THIRD FLOOR LOBBIES ARE LOCATED IN THE ATTIC.
 AHU'S SERVING THE HOUSE AND SENATE CHAMBERS ARE LOCATED IN THE BASEMENT

THIRD FLOOR MECHANICAL PLAN

1"=30'-0"



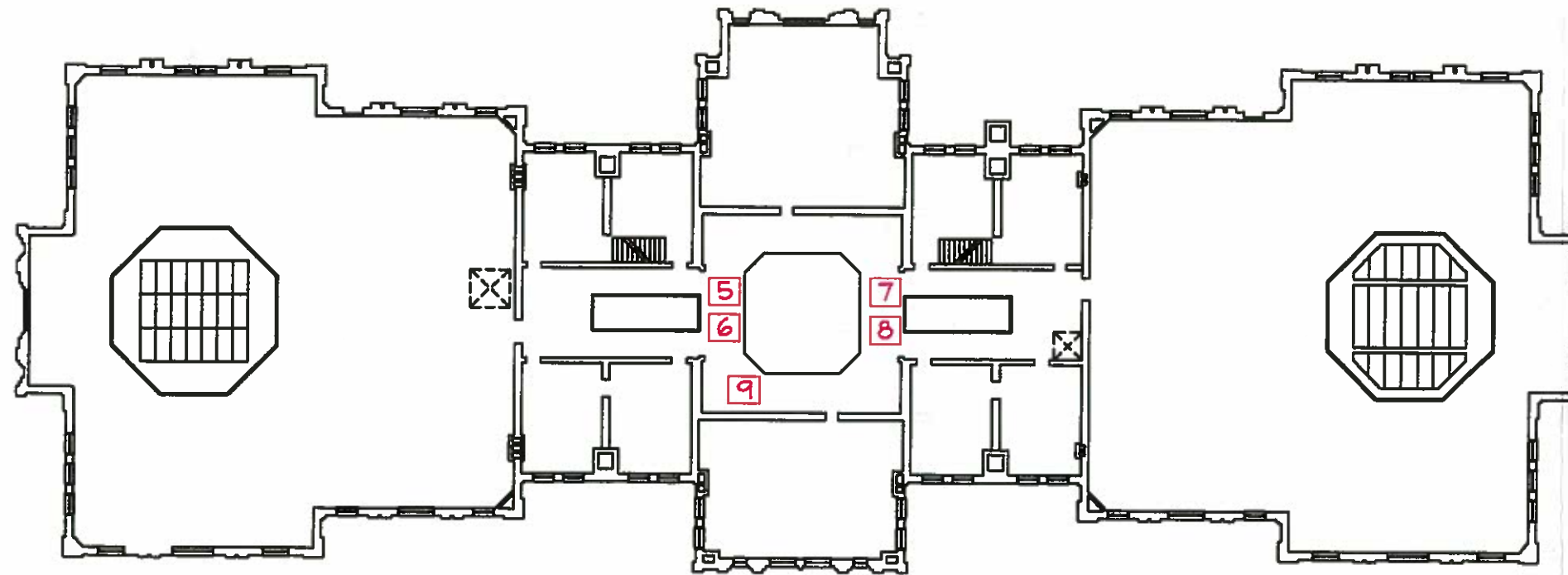
STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT Cheyenne, Wyoming

Project Number
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 Date Issued
 10-11-02
 Date Revised
 10-11-02
 Sheet Title
 THIRD FLOOR
 MECHANICAL
 PLAN

Sheet Number
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 FAX: (303) 233-5701
 MECHANICAL/ELECTRICAL ENGINEERS



HVAC SYSTEM ZONE LEGEND

- 5 AHU SERVING SENATE LOBBY (SECOND FLOOR)
- 6 AHU SERVING SENATE LOBBY (THIRD FLOOR)
- 7 AHU SERVING HOUSE LOBBY (SECOND FLOOR)
- 8 AHU SERVING HOUSE LOBBY (THIRD FLOOR)
- 9 AHU SERVING COMMITTEE ROOM

PENTHOUSE MECHANICAL PLAN

1"=30'-0"



STATE OF WYOMING CAPITOL CONDENSATE REPLACEMENT PROJECT Cheyenne, Wyoming

Project Number:
C02-096
Date Issued: 10-11-02
Date Revised:
Sheet Title:
PENTHOUSE
MECHANICAL
PLAN

Sheet Number:
M 3.4

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XII. Capitol Building Indoor Air Survey Test Results



Capitol Building Indoor Air Quality Test Results



Table 1
NAAQS/Miscellaneous Parameter Results

Location	Location ID	S02	HCHO	O3	CO (1 hr.)	CO (8 hr.)	PM10 ⁴	PM2.5 ⁴	NO2
	meas. Unit	ppm	ppm	ppm	ppm	ppm	ug/m3	ug/m3	ppm
Basement: Rm 9.3	S1	<0.06	<0.12	<0.03	0.168	<1	30	20	<0.01
Basement: Rm 8	S2	<0.06	<0.12	<0.03	0.160	<1	10	<20	<0.01
Basement: Rm 22	S3	<0.06	<0.12	<0.03	0.160	<1	20	20	<0.01
1st floor: Rm 110	S4	<0.06	<0.12	<0.03	0.152	<1	50	<10	<0.01
1st floor: Rm 138	S5	<0.06	<0.12	<0.03	0.128	<1	<10	30	<0.01
1st floor: Rm 134	S6	<0.06	<0.12	<0.03	0.072	<1	<10	<10	<0.01
2nd floor Senate Chamber	S7	<0.06	<0.12	<0.03	0.156	<1	20	20 ²	<0.01
2nd floor House Chamber	S8	<0.06	<0.12	<0.03	<0.001	<1	50	³	<0.01
3rd floor Senate Lobby	S9	<0.06	<0.12	<0.03	0.002	<1	30	2 ³	<0.01
Capital steps outside	S10	<0.06	<0.12	<0.03	0.001	<1	<20	³	0.004
	Average	<0.06	<0.12	<0.03	0.12	<1	26	19	<0.01
	Guideline	0.14 ¹	N/A	0.12	35	9	150 ¹	50 ¹	0.055

Notes: ¹ based on 24 hr. averaging
² torn filter
³ used for field blanks
⁴ Results are +/- 20 ug/m³

Table 2
Radon Gas Results

Sample#	Location	Canister	Start	End	Result, pCi/L
R1	Room 13, lateral file, NW corner	3119	13:35	13:35	0.5
R2	Room 13, lateral file, NW corner, duplicate	81	13:35	13:35	<0.5
R3	Room 9.1, next to 9.3, bookshelf	1144	13:40	13:40	<0.5
R4	Room 9, east side on bookshelf	6001	13:44	13:44	<0.5
R5	Room 10, top of LuAnn Chaffin's cubicle	6662	13:47	13:47	0.6
R6	Room 8.3, top of bookshelf at hallway	380	13:55	13:55	<0.5
R7	Room 14.1, top of phone stand, N. side	6542	14:00	14:00	<0.5
R8	Room 12/12.1, SW corner bookshelf	1005	14:05	14:05	<0.5
R9	Room 8, right side bookshelf	443	14:07	14:07	<0.5
R10	Room 6.3, top of shelf, E. side	65	14:10	14:10	4.3
R11	Room 15.4, top of pop machine	319	14:14	14:14	<0.5
R12	Room 17.1, N. side hallway on desk	607	14:18	14:18	<0.5
R13	Room 4.4, NW corner on bookshelf	579	14:25	14:25	<0.5
R14	Room 26/27, rear on bookshelf	6372	14:23	14:26	<0.5
R15	Room 26/27, rear on bookshelf, duplicate	777	14:23	14:25	<0.5
R16	Field blank	5	14:25	14:25	<0.5
R17	Room 22, on credenza	6562	14:30	14:30	0.8
R18	Room 31, near E. door, on bookshelf	6792	14:35	14:35	<0.5
R19	Room 18.2, top of refrigerator	1124	14:37	14:37	<0.5
R20	Field blank	6782	14:37	14:37	<0.5

Table 3
Asbestos Material Survey

Type of Material	Material Location	Sample #	Sample Location	Result
Plaster	Attic elevator shaft	01	Top of elevator shaft	ND
12x12 Floor tile/white speckled	Attic phone room east side	02	Attic phone room	Trace
Sheet rock/mud	Attic	03	Phone room	ND
Transite	Outside ceiling of N-Bsmt entrance women's BR side	04	Bsmt level north side entrance near women's BR	15%-C
Acoustical ceiling texture	Stairwell Bsmt-1 st and tunnel to Herschler Bldg	05	Tunnel to Herschler Bldg	ND
" " "	" "	06	Bsmt-1 st landing SW corner	ND
Wall texture	Throughout building	08	3 rd floor: Hse balcony, north wall near room H17	ND
" "	" "	09	3 rd floor: Hse balcony, west wall near rail into wall and H17	ND
" "	" "	10	2 nd floor: N-side of Hse chambers, janitor closet	ND
" "	" "	11	2 nd floor: Hse speaker office, n-wall outlet H5	ND
" "	" "	12	2 nd floor: s-side H1 and window under stairs	ND
" "	" "	13	2 nd floor: elevator near Senate chambers	ND
" "	" "	14	2 nd floor: Senate Chambers, janitor closet, below 2 nd floor univent control box	ND
Pipe insulation-brown	Pipe hangers	15	2 nd floor: Senate chambers, janitor closet	ND
Wall texture	Throughout building	16	2 nd floor: s-side across S4 office in hall behind Senate Chambers	ND
" "	" "	17	NW Senate Chambers offices S17	ND
plaster	Under stairwell	18	Top of stairs above ceiling	ND
Pipe insulation on hangers-white	Throughout basement level	19	Rm 17.1 at elevator	ND
" "	" "	20	Rm 17	ND
" "	" "	21	Rm 18.1	ND
Textured paint, wall and ceiling	Bsmt; above ceilings tiles in AG offices	22	Across room 19	ND
Light wt-white block	Bsmt: Attorney Gen'l offices	23	Rm 22 above door	ND
Pipe insulation-brown	" "	24	Rm 22 near east wall	ND
Texture paint wall and ceiling	" "	25	Rm 22 Beam above door	ND
Pipe insulation-white	" "	26	Rm 22 near east wall	ND

Table 3, con't

Asbestos Material Survey

Type of Material	Material Location	Sample #	Sample Location	Result
Pipe insulation-brown	" "	27	Hall near Rm 24	ND
Texture paint, wall and ceiling	" "	28	Near Rm 24 ceiling	ND
Duct insulation-inside duct	Basement level	29	Rm 9 across vault	ND
Texture paint, wall and ceiling	Basement level	30	Rm 9.1 outside door to 9.3	ND
2x4 Ceiling tile-white, deep fissure	Throughout basement	31	Rm 9 outside door to 9.3	ND
Texture paint, wall and ceiling	Basement	32	Rm 11.1	ND
Duct insulation outside duct	Bsmt: W. Mechanical room	33	Mechanical room	60%-C
Duct vibration collar insulation	Bsmt: W. Mechanical room	34	Mechanical room	ND
Duct insulation-inside duct	Bsmt: W. Mechanical room	35	Mixing plenum	ND
Duct insulation-inside duct	Bsmt: E. Mechanical Room	40	Access door in front under steam supply, lower unit	ND
Pipe insulation	Bsmt: E. Mechanical Room	Assumed	Bsmt: E. Mechanical Room, short section of pipe going N. into AG	--
Pipe insulation	Steam supply and return	Assumed	Bsmt; above tunnel to chiller room	--
Duct insulation outside duct	Bsmt; E. mechanical room	Assumed	Supply duct going S. into AG office	--

Table 4
Asbestos Air Sample Results

Sample#	Location	Volume (L)	Result (f/cc)
S1	Room 9.3	2574	<0.002
S2	Room 8	2523	0.003
S3	Room 23	2843	0.003
S4	Room 110	2262	0.008
S5	Room 138	2205	0.004
S6	Room 134	1763	<0.003
S7	Senate Chamber, 2nd Floor	1763	<0.003
S8	House Chambers, 2nd Floor	1923	<0.003
S9	Senate Lobby, 3rd Floor	1308	<0.004
	Field Blank	—	OK

Table 5
Lead-Based Paint Test Results

Sample #	Component	Basement
		pb mg/cm2
1	Wall	0.0
2	Ceiling	0.0
3	Wall	0.0
4	Wall	0.0
5	Wall	0.6
6	Window Sill	0.0
7	Wall	0.0
8	Window Sill	0.0
9	Wall	0.0
10	Wall	0.0
11	Wall	0.0
12	Wall	0.3
13	Wall	0.1
14	Wall	0.0
15	Wall	0.0
16	Wall	0.0
17	Wall	8.2
18	Wall	0.0
19	Wall	0.0
20	Wall	0.0
21	Wall (Tile)	0.0
22	Tile Floor	0.0
23	Wall	7.8
24	Wall	0.0
25	Wall	2.1
26	Wall	3.4
27	Wall	2.1
28	Wall	0.0
29	Wall	5.1
30	Wall	8.0
31	Wall	0.0
32	Wall	0.0
33	Wall	0.0
34	Wall	0.0
35	Wall	0.0
36	Wall	0.0
37	Wall	0.0
38	Wall	3.4
39	Wall	0.0
40	Wall	0.0
41	Wall	0.0
42	Wall	0.0
43	Wall	0.0
44	Wall	0.0
45	Wall	0.0
46	Wall	0.0
47	Wall	0.0
48	Wall	0.0
49	Wall	0.0

Table 5, con't
Lead-Based Paint Test Results

		Basement (Continued)
Sample #	Component	pb mg/cm2
50	Wall	0.0
		Mechanical
51	Wall	0.0
52	Wall	0.0
53	Wall	0.0
54	Wall	0.0
55	Wall	0.0
56	Wall	0.0
57	Wall	0.0
58	Wall	0.0
59	Wall	0.0

Table 5, con't
Lead-Based Paint Test Results

WYOMING STATE CAPITOL

1st Floor

NIST 1.02: 0.9, 1.1, 0.9

Sample #	Component	pb mg/cm2
1	Wall Panel	0.3
2	Wall	9.9
3	Wall	0.2
4	Corner Wall	9.9
5	Door	0.0
6	Wall	9.9
7	Wall	9.9
8	Upper Wall	9.9
9	Lower Wall	9.9
10	Baseboard	0.0
11	Wall	9.9
12	Upper Wall	1.2
13	Lower Wall	0.9
14	Baseboard	0.0
15	Wall	0.0
16	Lower Wall	1.1
17	Wall (Vinyl)	0.0
18	Wall	0.0
19	Wall	5.6
20	Wall Panel	0.0
21	Wall	0.0
22	Upper Wall	0.3
23	Lower Wall	0.0
24	Wall	0.0
25	Wall	0.0
26	Wall	0.0
27	Wall	0.0
28	Wall	0.0
29	Wall	5.5
30	Wall	9.9
31	Wall	9.9
32	Wall	0.0
33	Wall	0.0
34	Wall	9.9
35	Wall	0.0
36	Wall	9.9
37	Wall	5.0
38	Wall	9.9
39	Wall	9.9
40	Wall	9.9
41	Wall	9.9
42	Wall	0.4
43	Wall	0.0
44	Wall	2.4
45	Wall	1.1
46	Wall	0.0

Table 5, con't
Lead-Based Paint Test Results

1st Floor
(Continued)

Sample #	Component	pb mg/cm2
47	Wall	0.0
48	Wall	0.8
49	Wall	1.4
50	Wall	0.0
51	Wall	1.2
51	Wall	0.8 (Repeat)
52	Wall	1.4
53	Wall	9.9
54	Wall	9.9
55	Wall	0.0
56	Wall	9.9
57	Wall	0.0
58	Wall	0.0
59	Wall	0.0
60	Wall	2.4
61	Wall	1.3
62	Wall	2.4
63	Wall	9.9
64	Wall	9.9
65	Wall	9.9

Table 5, con't
Lead-Based Paint Test Results

2nd Floor

Sample #	Component	pb mg/cm2
1	Ceiling	0.0
2	Ceiling Molding	0.0
3	Wall	9.9
4	Wall	9.9
5	Wall	0.0
6	Wall	9.9
7	Wall	9.9
8	Wall	0.0
9	Wall	9.9
10	Wall	0.4
11	Wall	0.7
12	Wall (Tile)	0.0
13	Wall	0.5
14	Wall	0.5
15	Wall	0.0
16	Wall	0.0
17	Wall	6.5
18	Wall	0.0
19	Wall	0.5
20	Wall	0.0
21	Wall	0.3
22	Wall	9.9
23	Wall	9.9
24	Wall	9.9
25	Wall	9.9
26	Wall	9.9
27	Wall	9.9
28	Wall	9.9
29	Wall	9.9
30	Wall	9.9
31	Wall	9.9
32	Wall	9.9
33	Wall	9.9
34	Lower Wall	0.4
35	Lower Wall	0.4
36	Lower Wall	0.1
37	Lower Wall	0.1
38	Wall	9.9
39	Wall	9.9
40	Wall	0.4
41	Wall	9.9
42	Wall	9.9
43	Wall	9.9
44	Wall	9.9

Table 5, con't
Lead-Based Paint Test Results

3rd Floor

Sample #	Component	pb mg/cm2
1	Wall	0.5
2	Wall	0.7
3	Wall	9.5
4	Wall (Tile)	0.0
5	Wall	9.9
6	Wall	9.9
7	Wall	9.6
8	Wall	9.9
9	Wall	9.9
10	Wall	7.5
11	Wall	3.4
12	Wa;;	2.9
13	Wall	3.4
14	Stair Wall	9.9
15	Wall	9.9
16	Wall	0.1
17	Wall	4.2
18	Wall	9.9
19	Wall	9.9
20	Wall	9.9
21	Wall	9.9
22	Wall	9.9
23	Wall	9.9
24	Wall	9.9
25	Wall	9.9
26	Wall	9.9
27	Wall	9.9
28	Wall	9.9
29	Wall	9.9
30	Wall	7.9
31	Wall	7.0
32	Wall	0.0
33	Wall	9.8
34	Wall	0.0
35	Wall	9.9

NIST 1.02: 1.1, 1.0, 1.1

Table 6
Carbon Dioxide Measurements
(all measurements in parts per million)

Sample Location	Room	9-10 A.M. 8-26-02	8:35 A.M. 8-27-02	12:00 P.M. 8-27-02	3:00 P.M. 8-27-02	4:00 P.M. 8-28-02
S1, E1	9.3	690	790	720	800	830
E2,	9.9	690	820	700	810	840
E3	9.1	710	790	800	830	830
E4	10	790	810	830	870	920
E5	103	760	810	820	860	960
E6	14.1	750	780	770	890	1330/1170
E7	14.2	750	760	770	840	911
S2, E8	8	710	730	700	830	870
E9	8.3	740	710	820	820	870
E10	6.1	700	830	780	890	820
E11	4.6	700	760	740	780	870
E12	Betw. 111-112 main hall	750	900	870	980	820
E13	Next to 112.2	800	730	710	850	810
E14	113	740	760	790	830	830
E15	Next to 115	730	760	780	840	890
S4, E16	110	750	770	760	880	860
E17	109	780	800	770	900	880
S5, E18	138	700	720	740	830	780
E19	137	700	750	720	770	830
S6, E20	134	720	820	780	780	Occupied
E21	100.7	740	800	870	800	840
E22	100	780	770	760	750	820
E23	101	750	740	730	710	810
E24	102	740	740	770	770	760
E25	103	730	790	750	780	770
E26	124	730	740	720	790	800
E27	121	700	780	740	1040	840
E28	126	620	720	710	700	800
E29	123	670	810	790	730	780
E30	128	630	830	740	730	810
E31	31	680	790	720	790	840
E32	Next to room 18		770	750	890	860
E33	20	750	820	780	820	870
S3, E34	23	670	770	720	800	860
E35	Next to room 2	670	800	740	820	830
E36	4.4	720	800	770	840	870
E37	NW corner, Hse Chambers	670	760	740	730	880
E38	H12	680	760	710	690	870
E39	H10	650	710	690	740	N/A

Table 6, con't
Carbon Dioxide Measurements
(all measurements in parts per million)

E40	H17	690	720	710	750	N/A
E41	H18	660	720	700	720	N/A
E42	302	670	730	680	720	820
E43	S-18	710	720	730	750	N/A
E44	Senate Lobby	740	840	740	730	870
E45	Senate Chambers, balcony	840	830	710	720	840
E46	Between room 302 & LSO	740	750	700	740	930
E47	LSO copy room	760	760	820	850	810
S7, E48	Senate Chamber	760	720	730	790	900
E49	S5	730	710	700	770	920
E50	S6	740	700	750	840	920
E51	N hall	810	700	730	830	850
E52	E hall	760	710	750	820	880
E53	Senate Lobby	720	740	720	800	920
E54	Next to room 209	820	760	730	800	880
E55	213	830	810	790	880	900
E56	214	800	840	810	830	950
E57	House Lobby	710	710	700	730	830
S8, E58	House Chamber	680	710	710	730	830
E59	H4	700	730	710	710	920
E60	N hall	840	750	780	740	880

Tables 7.1 – 7.4 Mold Sample Results

Table 7.1
Air samples for mold spores

Sample #	Location	Genus/species	Result*
Samples Collected on 9-18-02			
M1	Room 17.1 at tunnel door	<i>Cladosporium</i>	46
		Hyphae	46
M2	Room 9.3	<i>Alternaria</i>	46
M3	Background: outside S. entrance E of main door	<i>Agrocybe/Coprinus</i>	137
		<i>Cladosporium</i>	46
M4	Room 8.6	<i>Cladosporium</i>	289
		Unidentified	96
M5	Room 110	Unidentified	91
M6	Room 119, inside double doors	Unidentified	48
M7	Senate chambers, 2nd floor	Unidentified	46
M8	Senate lobby, 3rd floor	<i>Cladosporium</i>	137
		Unidentified	46
M9	House chambers, 2nd floor	<i>Agrocybe/Coprinus</i>	46
M10	Background: outside S. entrance E of main door	<i>Alternaria</i>	45
		<i>Cladosporium</i>	892
		Unidentified	89
M11	Room 134, Govn's office, S. side	<i>Cladosporium</i>	83
		Hyphae	42
M12	Room 134, Near conference table	Unidentified	42
Samples Collected on 9-19-02			
M13	Room 134, Govn's office, Conference Table	<i>Alternaria</i>	42
		<i>Cladosporium</i>	208
M14	Room 134, Govn's office, Conference Table	<i>Agrocybe/Coprinus</i>	46
		<i>Cladosporium</i>	411
M19	Room 18.2, under table, S. side	<i>Aspergillus/penicillium</i>	91
		<i>Cladosporium</i>	46
M20	Background: outside S. entrance	<i>Alternaria</i>	46
		<i>Cladosporium</i>	137
M21	Room 17.1, near tunnel door	<i>Agrocybe/Coprinus</i>	46
		<i>Cladosporium</i>	183
M22	Room 8.6, near window	<i>Cladosporium</i>	91
		Unidentified	46

* Counts per cubic meter of air. Results are compared to background samples.
See results and discussion.

Table 7.2
Carpet samples for viable mold

Sample # Samples Collected on 9-19-02	Location	Genus/species	Result*
M24	Room 18.2, under table on S. side	None	
M25	Room 13, @ door to Room 8.5	<i>Rhodotorula</i>	300
M26	Room 17.1, near tunnel door, center	None	
M27	Room 134, Govn's office, S. wall near fan coil	None	
M28	Room 134, Govn's office, under curtain near East wall fan coil unit	<i>Alternaria</i>	111,111
		<i>Penicillium</i>	111,111
M29	Room 8.6, SE corner	<i>Alternaria</i>	100

* Colony-Forming Units per sample
See Results and Discussion in report

Table 7.3
Surface samples for viable mold

Sample # Samples Collected on 9-19-02	Location	Genus/species	Result*
M15	Room 134, Govn's office fan coil unit on E. wall, below coils	Yeast	100
M16	Room 134, Govn's office on coils	Yeast	200
M17	Room 134, Govn's office drip pan cold side	None	
M18	East end basement mechanical room, drain from lower AHU	<i>Aspergillus niger</i> <i>Fusarium</i> <i>Rhodotorula</i>	100 134,000 >300,000

*Colony-Forming Units per swab
See Results and Discussion in report

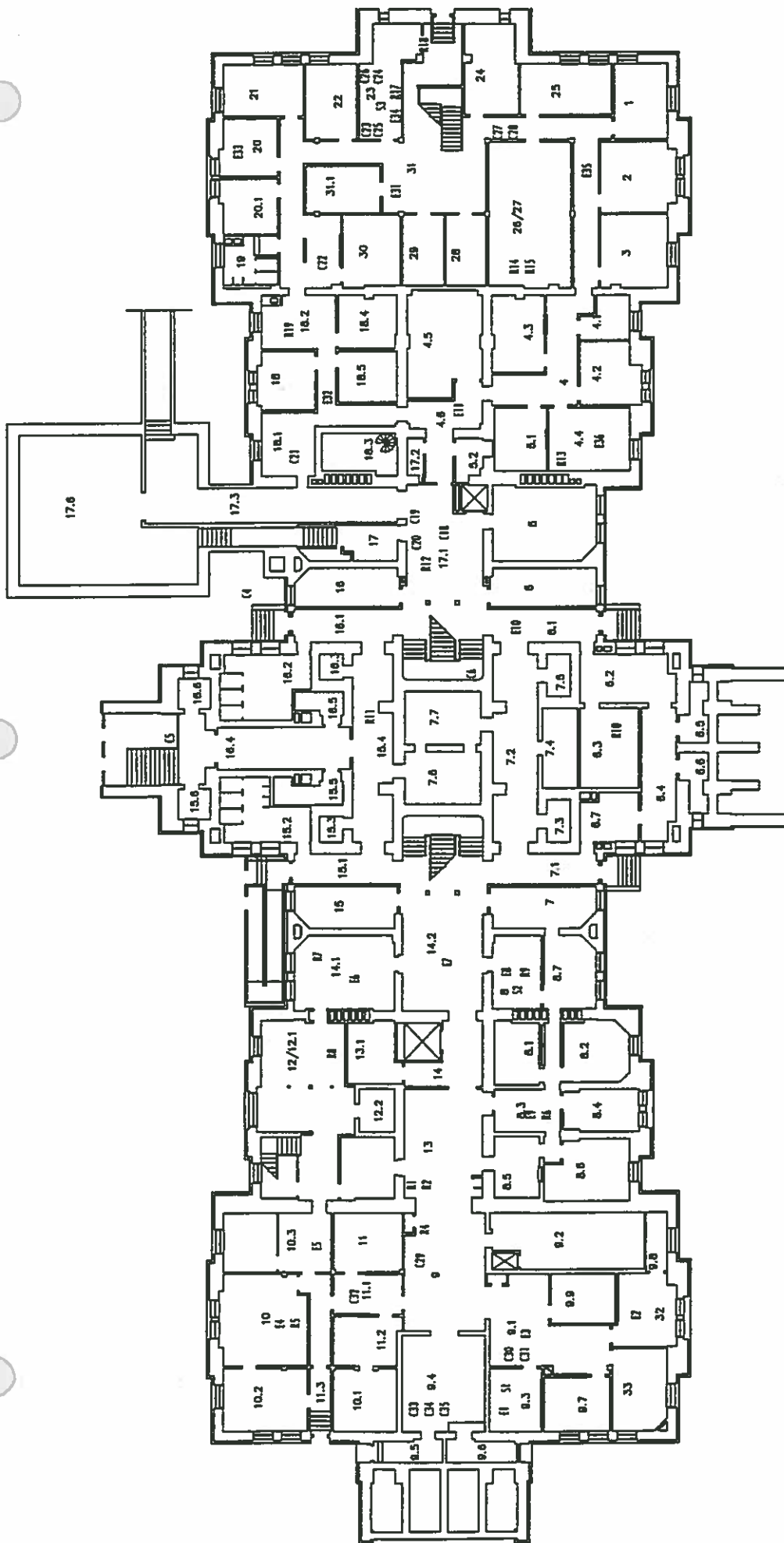
Table 7.4
Surface samples for mold spores
Direct Lift Method (Tape)

Sample # Samples Collected on 9-19-02	Location	Genus/species	Result*
M30	Room 134, Govn's office top of picture on east wall	Aspergillus/penicillium Bipolaris Cladosporium Hyphae	Many Rare Moderate Few
M31	Room 134, Govn's office top of closed door frame, east wall	Alternaria Chaetomium Cladosporium Stachybotrys	Few Few Few Rare
M32	Room 18.2, under table on S. side	Agrocybe Cladosporium Stachybotrys	Few Few Rare
M33	Room 13, top of door frame South wall	Cladosporium Stachybotrys Hyphae	Few Few Few
M34	Room 8.6, top of picture frame on bookshelf in SE corner	Aspergillus/penicillium Chaetomium Cladosporium Stachybotrys Hyphae	Few Few Moderate Few Few

* prevalence of spores found on each sample; semi-quantitative
see Results and Discussion in report

Capitol Building Indoor Air Quality Test/Sample Locations





NOTES:
 S 1-10
 C 1-40
 R 1-20
 C 1-35

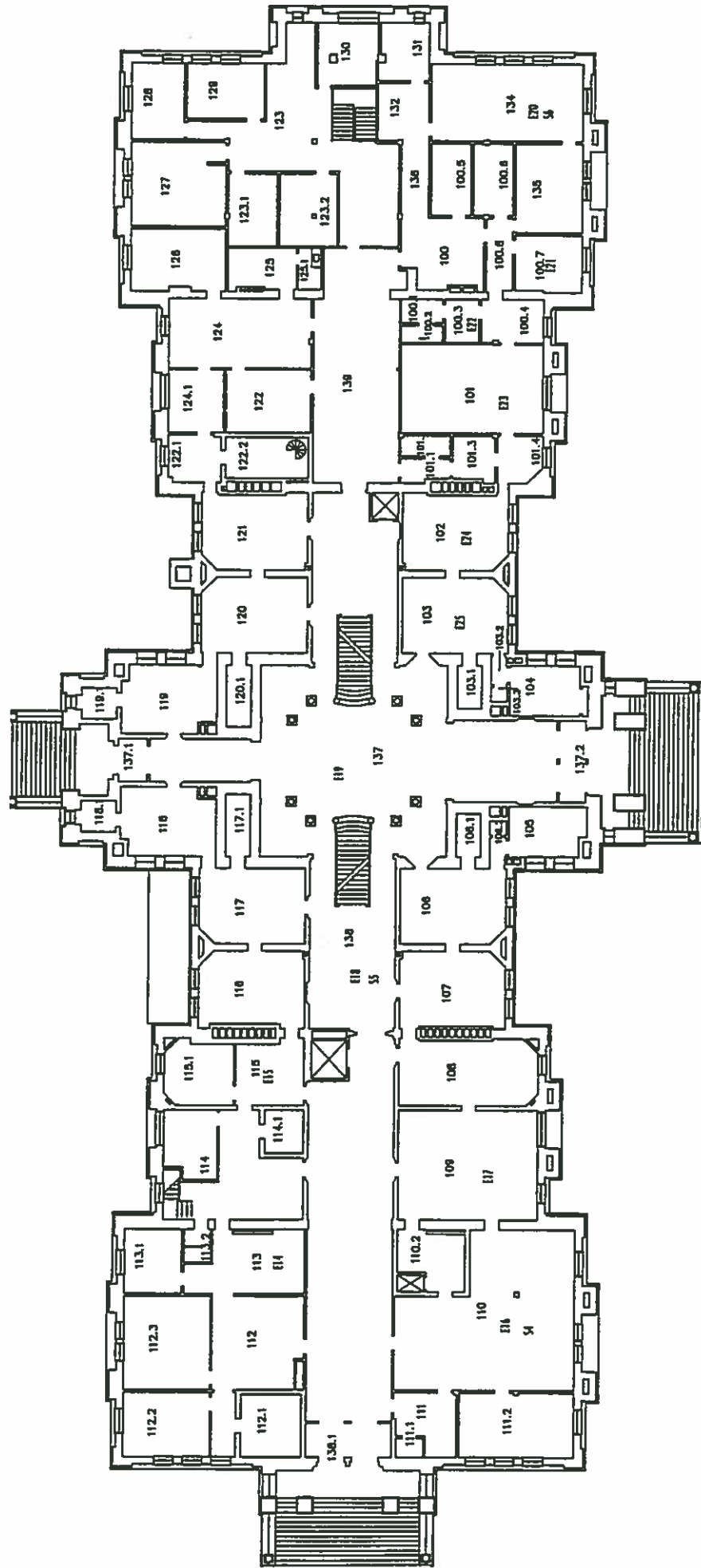
SAMPLE LOCATIONS FOR CARBON DIOXIDE TESTING
 SAMPLE LOCATIONS FOR RADON GAS TESTING
 SAMPLE LOCATIONS FOR ASBESTOS MATERIAL TESTING

NORTH



CAPITOL BUILDING EXISTING BASEMENT FLOOR PLAN

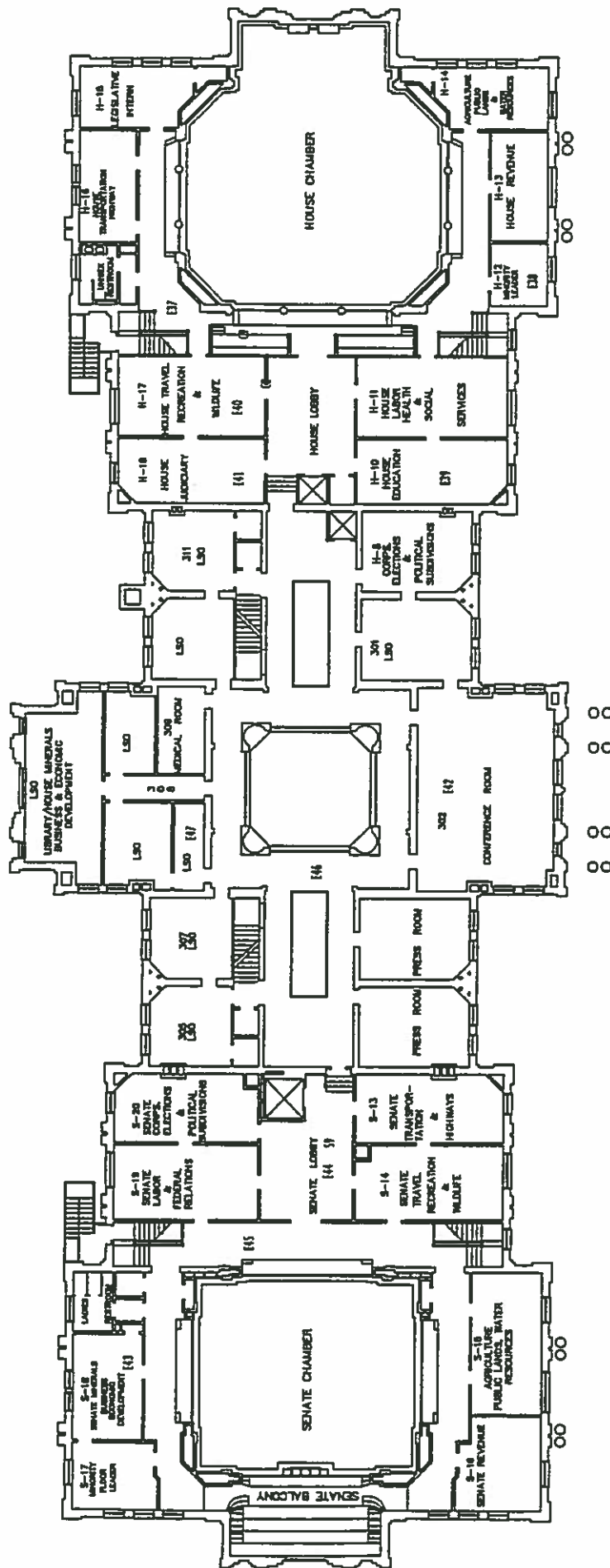
J. WALKER capitol/capbase-occl.dwg 12/19/01
 SAMPLE LOCATIONS ADDED 8/29/02 S. MERRILL



NOTES:
 S 1-10
 E 1-80
 SAMPLE LOCATIONS FOR VARIOUS PARAMETERS
 SAMPLE LOCATIONS FOR CARBON DIOXIDE TESTING



CAPITOL BUILDING EXISTING FIRST FLOOR PLAN



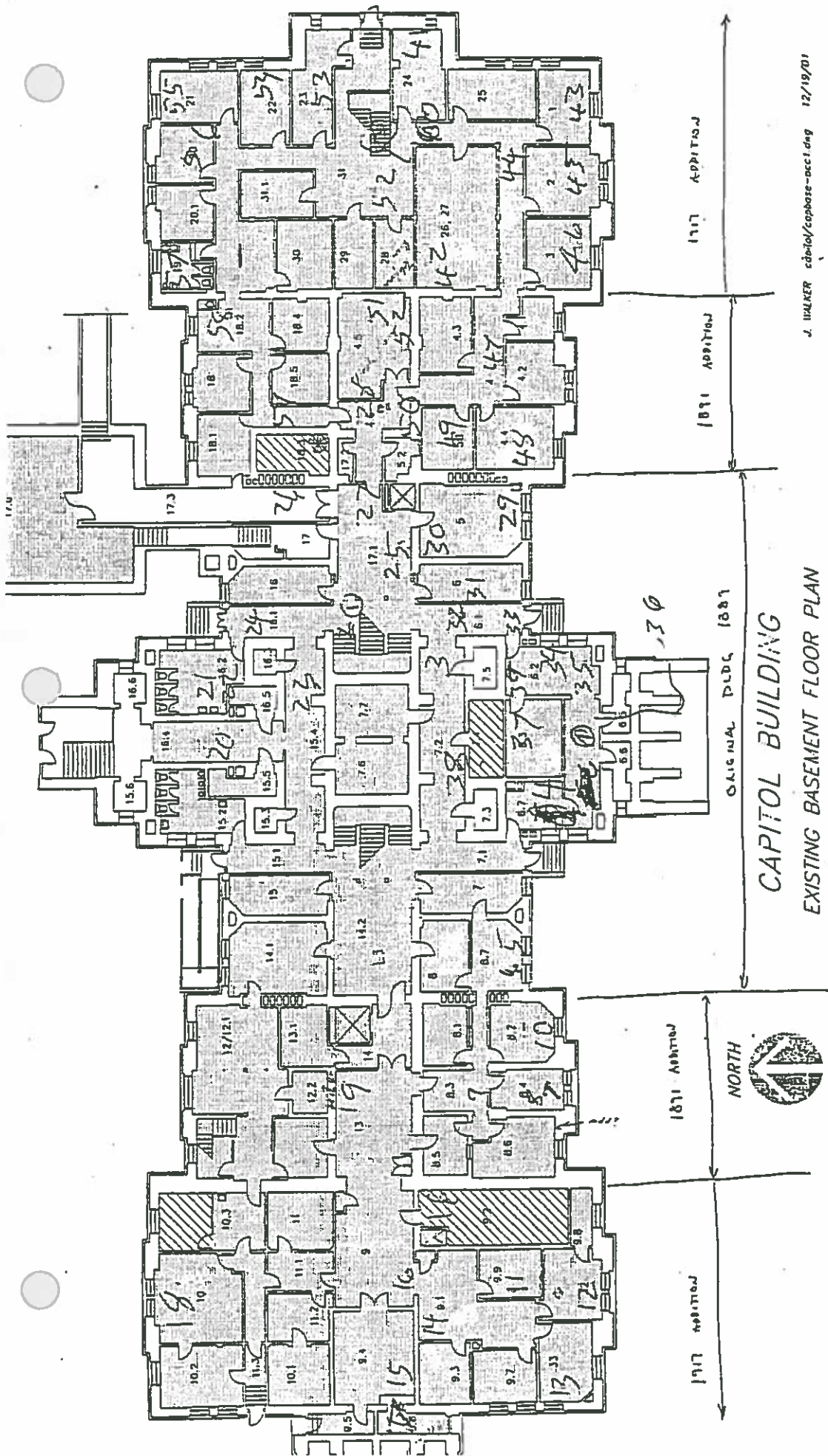
NORTH

CAPITOL BUILDING EXISTING THIRD FLOOR PLAN

NOTES:
S 1-10
E 1-60
C 1-35

SAMPLE LOCATIONS FOR VARIOUS PARAMETERS
SAMPLE LOCATIONS FOR CARBON DIOXIDE TESTING
SAMPLE LOCATIONS FOR ASBESTOS MATERIAL TESTING

J. WALKER, CAPITAL/CAP03-eccl.dwg, 12/19/01
SAMPLE LOCATIONS ADDED 9/29/02 S. MERRILL



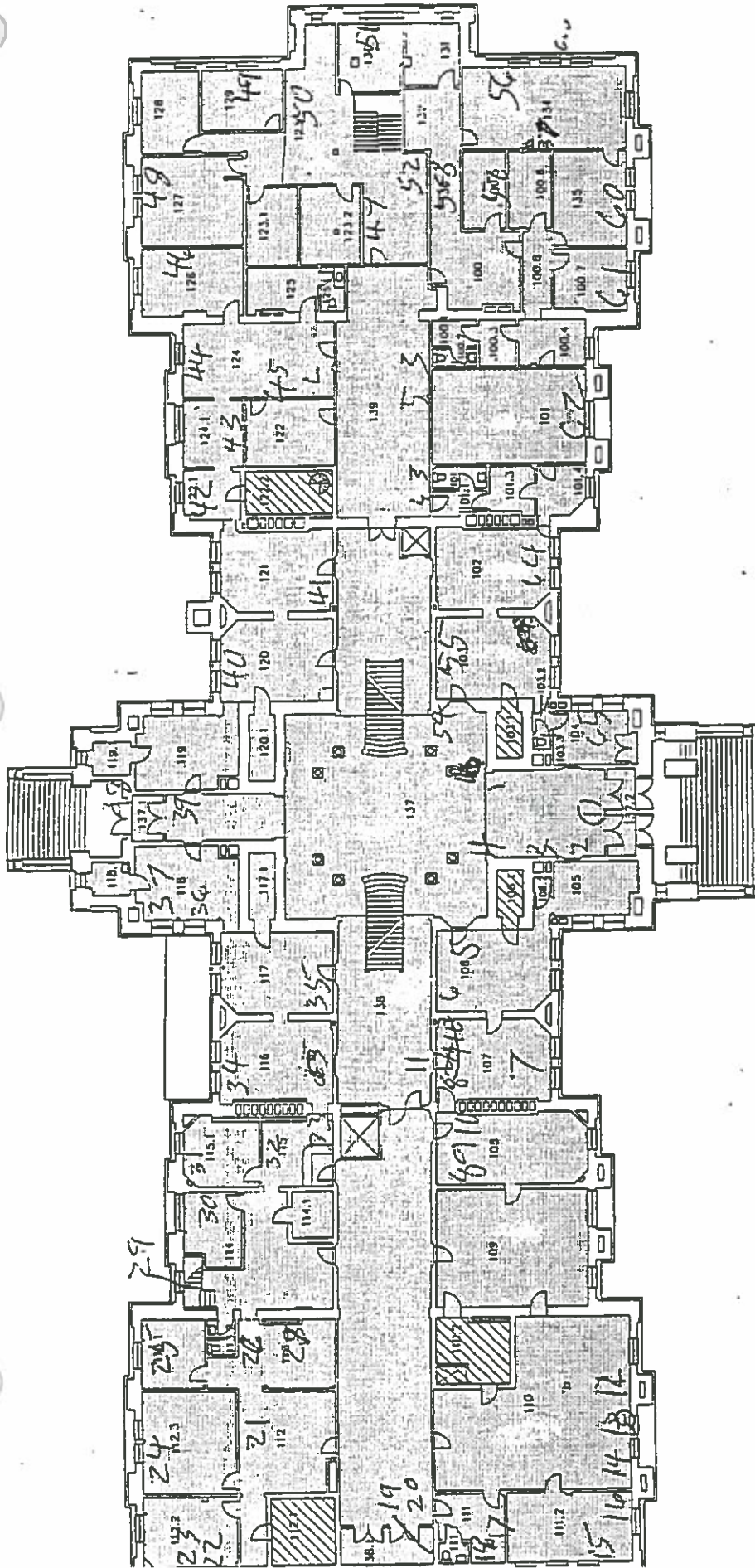
J. WALKER c:\w\ol\capbase-dcc1.dwg 12/19/01

LEGEND

- SECRETARY OF STATE
- AUDITOR
- TREASURER
- ATTORNEY GENERAL

- GROUNDS & MAINTENANCE
- PUBLIC SPACES
- CONFERENCE ROOMS
- UTILITY ROOMS

Lead-Based Paint Test Locations






CAPITOL BUILDING
EXISTING FIRST FLOOR PLAN

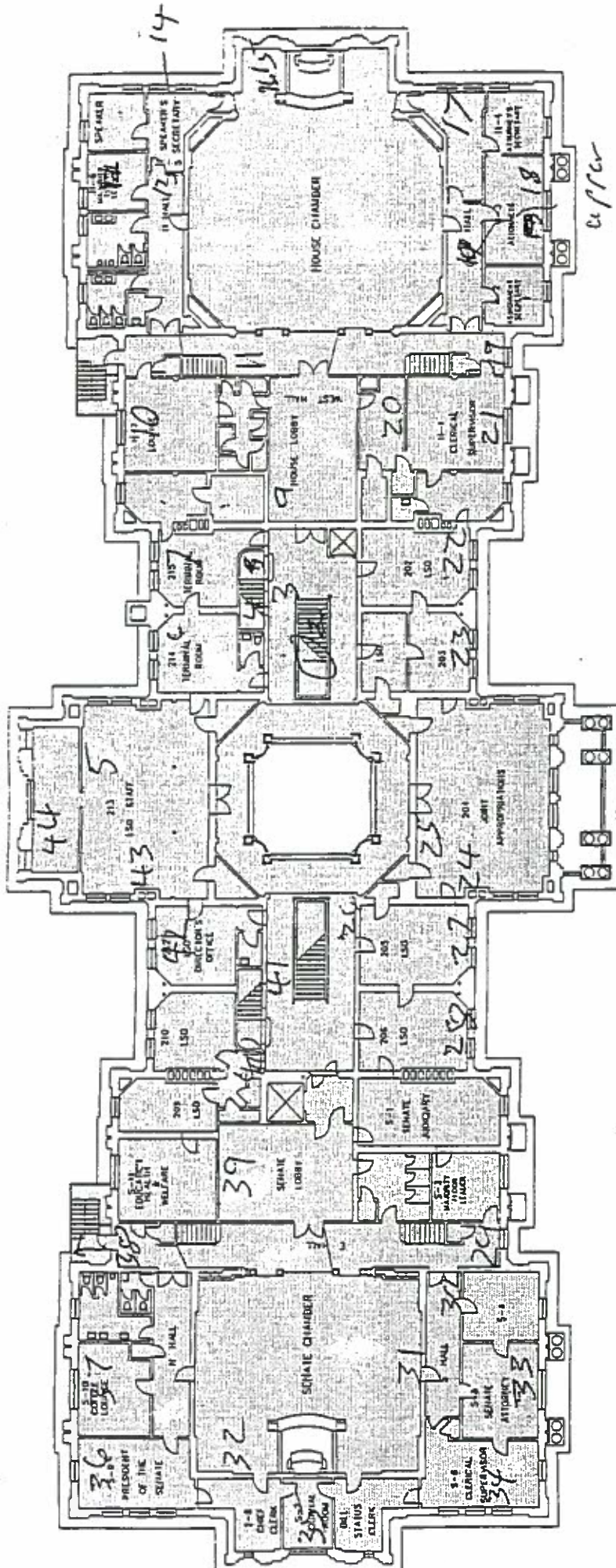
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-  SECRETARY OF STATE
-  AUDITOR
-  TREASURER

-  GROUNDS & MAINTENANCE
-  PUBLIC SPACES
-  CONFERENCE ROOMS

Lead-Based Paint Test Locations



CAPITOL BUILDING
EXISTING SECOND FLOOR PLAN

J. WALKER capitol/cap02-sec2.dwg 12/17/01

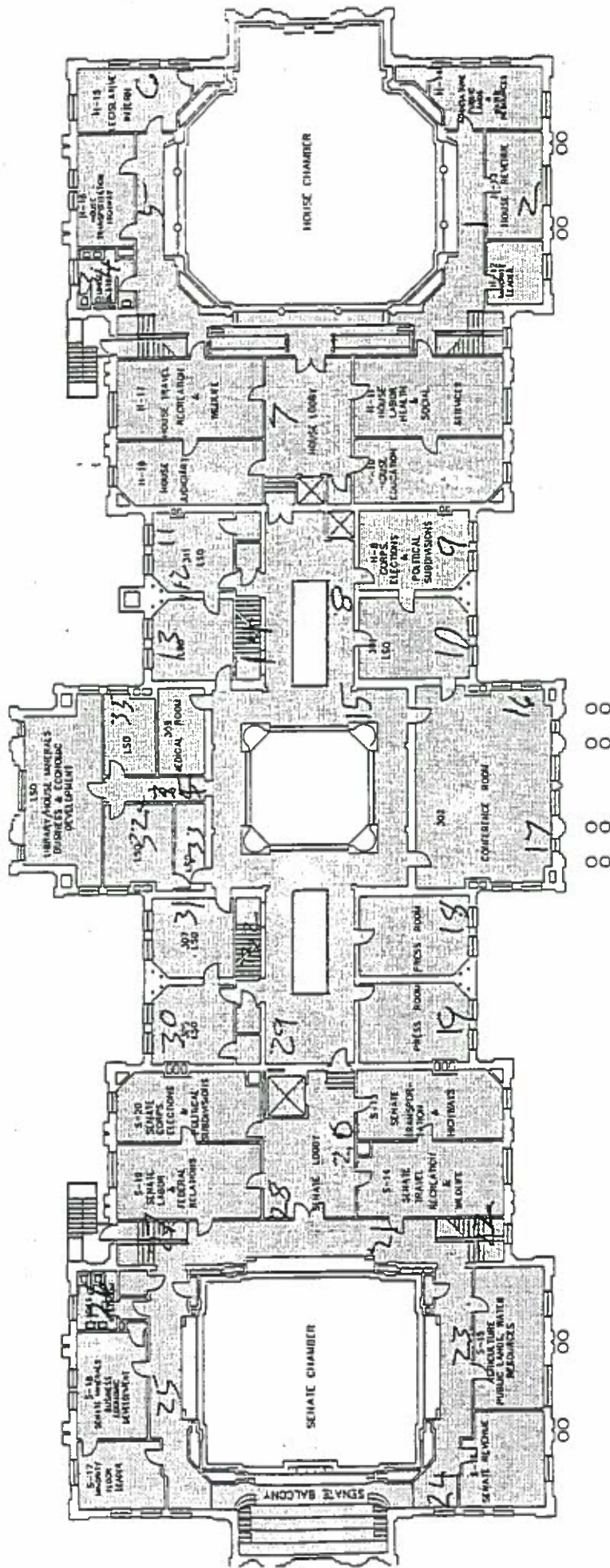


LEGEND

- SECRETARY OF STATE
- AUDITOR
- TREASURER
- ATTORNEY GENERAL
- GOVERNOR
- LEGISLATIVE SERVICES OFFICES

- GROUPS & MAINTENANCE
- PUBLIC SPACES
- CONFERENCE ROOMS
- VAULT (COLORS VARY ACCORDING TO DEPT.)
- MECHANICAL

Lead-Based Paint Test Locations



CAPITOL BUILDING
EXISTING THIRD FLOOR PLAN

J. WALKER cap03-cap03-act.dwg 12/19/01

LEGEND

- SECRETARY OF STATE
- AUDITOR
- TREASURER
- ATTORNEY GENERAL
- GOVERNOR
- LEGISLATIVE SERVICES OFFICE

- GROUPS & MAINTENANCE
- PUBLIC SPACES
- CONFERENCE ROOMS
- VAULT (COLORS VARY ACCORDING TO DEPT.)
- MECHANICAL

Lead-Based Paint Test Locations

Capitol Building Field Data for Indoor Air Quality Tests



Sampling Data

Project:	Wyoming State Capitol Building Condensate Project	Date:	8-28-03
Location:		IH:	JED/DMF

Sample Location/Activity/Name	Time	Parameter	Result	Method
Location S1	14:15	O ₃	WHT I (6) LMDL	the
↓	14:22	HCHO	WHT (5) LMDL	
↓	14:33	SO ₂	WHT III (8) LMDL	
Location S2	14:40	SO ₂	WHT III (8) LMDL	
↓	14:45	III HCHO	WHT (5) LMDL	
↓	14:50	O ₃	WHT I (6) LMDL	
Location S4	15:10	SO ₂	WHT III (8) LMDL	
↓	15:15	HCHO	WHT (5) LMDL	
↓	15:25	O ₃	WHT I (6) LMDL	
Location S5	15:40	SO ₂	WHT III (8) LMDL	
		HCHO	WHT (5) LMDL	
		O ₃	WHT I (6) LMDL	
outs. do Location S10	16:00	SO ₂	WHT III (8)	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 08-28-02

Location: _____

IH: D. Fernandez

Sample Location/Activity/Name	Time	Parameter	Result	Method
location outside S/D		HCHO	HL ⑤ <MDL	
↓		O ₃	HL HL ⑥ <MDL	
location S3		SO ₂	HL HL ⑧ <MDL	
↓		HCHO	HL ⑤ <MDL	
↓		O ₃	HL ⑥ <MDL	
location S8		SO ₂	HL HL ⑧ <MDL	
↓		HCHO	HL ⑤ <MDL	
↓		O ₃	HL HL ⑥ <MDL	
location S6	8/29/02 3PM	SO ₂	HL HL ⑧ <MDL	
		HCHO	HL ⑤ <MDL	
		O ₃	HL HL ⑥ <MDL	
location S7 state chambers		SO ₂	HL HL ⑧ <MDL	
		HCHO	HL ⑤ <MDL	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 85-29-02

Location: _____

III: 2. Februar 1962

[illegible]

Sampling Data

Project:	Wyoming State Capitol Building Condensate Project	Date:	09-04-02
Location:		By:	D Fernandez

Sample Location/Activity/Name	Time	Parameter	Result	Method
CO #1 Location SI Tube 500	8:38a 4:37	3507 3511	1686	482 min
CO #2 Location SI Tube 500	8:40 4:39	3523 352	1687	483 min
CO #3 Location SI Tube 03 Ramp 15	8:45 4:40	3531 351	1672	475 min
MiniW/MS7 2nd floor Senate Chm.	9:03 10:03	CO - NO2 -	0.156 0.000	
S9 3rd floor Sen lobby	10:15 11:15	CO - NO2 -	0.002 0.000	
S8 2nd floor Hse Chm	11:20 12:20	CO - NO2 -	0.000 0.000	
S10 - Outside	1:05 2:05	CO - NO2 -	0.001 0.004	
S6				

T10-01 3511
3511
3510

T10-02 3507
3507
3405

T10-03 3511
3511
3519

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 09-06-02

Location: _____

IH: D. Fernandez

Sample Location/Activity/Name	Time	Parameter	Result VOLUME	Method
<i>Locations CO tube pump</i> T ₁₀ -04 54 4 500	8:36	3.515 3.53 3.50	1705	486
T ₁₀ -05 55 5 501	8:32	3.519 3.51	1733	493
T ₁₀ -07 57 7 175	8:40	3.575 3.53	1698	482
T ₁₀ -08 58 8 227	8:42	3.527 3.55	1709	483
09-19-02- <i>const dust very windy day</i>				
T ₁₀ -09 500	9:40 15:59	3.519 3.518	1334	361
T ₁₀ -6 56 6 501	15:52 9:47	3.575 3.58	1295	36
T ₁₀ -10 <i>110 ft N side of birds</i> 175	9:55 16:00	3.510 3.518	1283	36
T _{2.5} -06 227	15:52 9:47	3.515 3.12	1320	-
T _{2.5} -09 59 9 166	9:40 16:40 16:53	3.549 3.54	1329	-
MINI WALK <i>CO tube</i> 56	9:48 12:48	CO2 0.72 NO 0.000		

end day

T₇ 3531
3548
3531

T₈ 3556
3553
3556

T₄ 3507
3493
3497

T₅ 3499
3531
3507 } 3512?

*Watch not working
for post-timer;
use pump LCD*

Sampling Data

Project:	Wyoming State Capitol Building Condensate Project	Date:	09-18-02
Location:		IH:	D. Fernandez

DUST-

Sample Location/Activity/Name		Pump#	Time	Parameter	Result VOLUME	Method
S1	Rm 9.3	501	9:24 4:56	3.52 3.547	1597	-2min
S3	Rm 23	166	9:34 4:48	3.53 3.569	1540	-20
S5	Rm 138	227	9:26 4:47	3.50 3.528	1550	44
S7	2nd floor Senate Chamber	175	9:38 4:57	3.49 3.47	1542	444
S8	2nd floor Hse Chamber	500	9:30 4:34	3.49 3.458	1473	424
S2 Field Blank						
S4 " "						
S10 " "						

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 8-26-02

Location: _____

IH: JED/DAF

Sample Location/Activity/Name	Time	Parameter	Result	Method
R1 Room 13, lateral flk NW corner #3119	13:35 13:35	Radon	0.2	
R2 " " duplicate " " " " #81	13:35 13:35		0.2	
R3 Room 9.1 next to 9.3, bookshelf #1144	13:40 13:40		2.2	
R4 Room 9. east side on bookshelf #6001	13:44 13:44		1.2	
R5 Room 10 top of LuAnn Chaffin's cabinet 6662	13:47 13:47		0.3	
R6 Room 8.3 top of bookshelf at hallway #380	13:55 13:55		1.2	
R7 Room 14.1 top of phone stand N. side #6542	14:00 14:00		2.5	
R8 Room 12/12.1 SW corner bookshelf #1005	14:05 14:05		1.8	
R9 Room 8, Right side bookshelf #443	14:07 14:07		2.5	
R10 Room 6.3 Top of shelf e. side #105	14:10 14:10		4.3	
R11 Room 15.4 Top of pop machine #319	14:14 14:14		1.5	
R12 Room 17.1 N. Side hallway incense #607	14:18 14:18		2.5	

All canisters were sealed on 8-28-02 at the time noted above the first time indicated; which was the set time.

Sampling Data

Project:	Wyoming State Capitol Building Condensate Project	Date:	8-26-02
Location:		IH:	JED / DAF

Sample Location/Activity/Name	Time	Parameter	Result	Method
R13 Room 4.4 NW corner, on bookshelf #579	14:25 14:25	Radon	1.5	
R14 Room 26/27 near, on bookshelf #6372	14:26 14:28		1.5	
R15 duplicate " " " " #777	14:25 14:28		1.5	
R16 Field Blank " " " " #5	14:25 14:28		1.5	
R17 Room 22 on credenza #6562	14:30 14:30		1.5	
R18 Room 31 near east door on bookshelf #6772	14:35 14:35		1.5	
R19 Room 18.2 Top of refrigerator #1124	14:37 14:37		1.5	
R20 Field Blank #6752	14:37 14:37		1.5	

Asbestos Inspection Form

Project: Cator - Runkel Date: 09-06-02
 Location: Cheyenne Capitol P/N: _____
 IH: D. Fernandez

Area	Type of Material	Material Location(s)	Qua	Frb	Cnd	#Spl	Sample Location	Result
01	Plaster	Elevator shaft				01	Top of elevator shaft - E	ND
02	12x12 Floor-Tile	Speaker at lobby phone room - top of tile				02	Artic phone room	ND
03	Shut-off panel	Artic				03	Artic room	ND
04	Transite panel	Outside Building of (S) BSMT entrance				04	BSMT level North Side	1570
05	Plaster texture	Stairwell BSMT-1 st tunnel to Hall				05	tunnel to the east side	ND
						06	BSMT 1 st hallway A BSMT corner	ND
06	wall texture					07	NOT SAMPLED	
						08	3 rd floor: HSE lobby ceiling	ND
						09	3 rd floor: HSE lobby ceiling	ND
						10	2 nd floor: N side of HSE lobby	ND
						11	2 nd floor: HSE north wall - outlet	ND
						12	2 nd floor: (S) side of HSE lobby	ND
						13	2 nd floor: elevator near S side	ND
						14	2 nd floor: elevator near S side	ND

Comments: _____

2nd Floor H₂O damage entrance to HSE lobby ceiling 2nd floor S side Janitor closet near S side 1st floor E.T.

Asbestos Inspection Form

206

Project: Catur Runne Date: 09-19-02

Location: Chyenne Capitol IH: O. Fernandez

Area	Type of Material	Material Location(s)	Qua	Frb	Cnd	#Spl	Sample Location	Result
7	Pipe insulation - brown	Next to hangar - motor closet				15	2nd floor - Sample closet	ND
8	Wall texture	↓				16	2nd floor - Sample closet	ND
9	Different planks	Under stairwell etc. in entrance ceiling, basement				17	2nd floor - Sample closet	ND
10	Pipe insulation - white	↓				18	Top of stairs - white ceiling	ND
		↓				19	Rm 19.1 at elevator	ND
		↓				20	Rm 17	ND
11	Texture paint of wall & ceiling	Basement above ceiling tile in office				21	Rm 18.1	ND
12	Light block	Attorney Gen'l office				22	Att 1055 Rm 19	ND
	↓	↓				23	Rm 22 above door	ND
7	Pipe insulation - brown	Basement				24	Rm 22 - Sample closet	ND
10	Pipe insulation - white	Basement				25	Rm 22 - Sample closet	ND
7	Pipe insulation - brown	Basement				26	Rm 22 - Sample closet	ND
11	Texture paint ceiling	Basement				27	Hallway Rm 24	ND
		↓				28	Ceiling near Rm 24	ND

Comments:

* 2 pipes brown insulation
white insulation
Century Environmental Hygiene
C:\My Documents\ADMINISTR\BUSINESS\FORMS\Bulk Sample Form.doc

* Hangers on brick structures
* Texture could be behind wallpaper

See concrete bldg not drawn page
caused H₂O damage in
wall & ceiling

27

Cato: Luma

Cheyenne Capital

Date: 09-18-02

И: Районный

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----

[illegible]

Asbestos Air Sampling Data

Project: U.S. State Capitol Condensate Project Date: 09-18-02

Location: _____ IH: D. Fernandez

#	Type	Sample Location/Activity/Name	Pump/SN	Pre/Post	Ave Cal	Start/End	Min.	Tot. Vol.	Fbs/Fld.	Fibers/cc
S1	Blank	Rm 93	14	11.7 11.7	11.7	9:57 1:37	220	2574	6.5/100 1.10	40.002
S2	Blank	Rm 8	16	11.9 11.9	11.9	10:03 1:35	212	2523	1.35	0.003
S3	Blank	Rm 23	17	13.9 13.9	13.8	10:15 1:41	206	2843	1.5	0.003
S4	Blank	Rm 11D → (laying carpet in lobby just outside door)	32	11.2 11.2	11.2	10:30 1:52	202	2262	3.75	0.008
S5	Blank	Rm 138	25	12.7 12.5	12.6	10:55 1:50	175	2205	1.75	0.004
S6	Blank	Rm 134	32	11.2 10.7	10.95	2:23 4:44	161	1763	7.5/100 1.10	40.003
S7	Blank	Senate Chambers - 2nd floor	25	11.7 11.2	11.45	2:15 4:49	154	1763	7.1/100 1.10	40.003
S8	Blank	House Chambers - 2nd floor	16	12.4 12.1	12.25	2:10 4:49	157	1923	5/100 1.10	40.003
S9	Blank	Senate Lobby - 3rd floor	14	11.2 10.6	10.9	2:18 4:18	120	1308	6/100 1.10	40.004
S	B	Field Blank	n/a						0/100	OK

CBR: Cannot be read; sample has >50% particulate

B: Blank P: Personal A: Area/Environmental (BACK) Background F: Final/Clearance Analyzed by: Deborah Fernandez

Notes: Background air samples collected

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 5-26-02

Location: _____

IH: SED/DAF

Basement

Sample Location/Activity/Name		Time	Parameter	Result	Method
S1	S1, E1 Room 9.3	8:45	CO ₂	690	
	E2 " 9.9	"	"	690	
	E3 " 9.1 (middle)	"	"	710	
	E4 10	9:00	"	790	
	E5 " 10.3			760	
	E6 " 14.1			750	
	E7 " 14.2	9:05		750	
S2	E8, S2 " 8	"		710	
	E9 " 8.3	"		740	
	E10 " 6.1			700	
	E11 " 4.6			700	
	E12 Behs. 111, 112 Main hall	9:30		750	
	E13 Next to room 112.2			800	

(S1)



Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 8-26-02

Location: _____

IH: JED/DAP

First Floor

Sample Location/Activity/Name	Time	Parameter	Result	Method
E14 Room 113	9 ³⁵	CO2	740	740
E15 Next to Rm. 115	9 ³⁵		730	
S4 E16 Room 110 S4			750	
E17 Room 109	9 ⁴⁵		780	
S5 E18 S5 Room 138			700	
E19 Room 137			700	
S6 E20 Room 137 S6	9 ⁵⁵		720	
E21 Room 100.7			740	
E22 Room 101.100	10 ⁰⁰		780	
E23 Room 101			750	
E24 Room 102	10 ⁰⁸		730/740	
E25 Room 103	10 ¹⁰		740/730	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 8-26-02

Location: _____

IH: JED/DAF

1st + Basement

Sample Location/Activity/Name	Time	Parameter	Result	Method
E26 Room 124	10:15	CO2	730	
E27 Room 121			700	
E28 Room 126	10:20		620	
E29 Room 123			670	
E30 Room 128			630	
E31 Room 31	10:25		680	
E32 " next to room 18				
E33 Room 20	10:30		750	
S3 E34 S3 Room 23			670	
E35 Next to Room 2			670	
E36 Room 4,4	10:36		720	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 8-26-02

Location: _____

IH: JED/DAF

Third Floor

Sample Location/Activity/Name	Time	Parameter	Result	Method
E37 NW Corner House Chamber	10 ³⁸	CO ₂	670	
E38 Room H12			680	
E39 Room H10	10 ⁵⁰		650	
E40 Room H17	10 ⁵⁵		690	
E41 Room H18			660	
E42 Room 302	11 ⁰⁵		670	
E43 Room S-18	11 ¹⁵		710	
E44 Senate Lobby			740	
E45 Senate Chamber balcony area	11 ²⁵		840	
E46 Between Room 302 + LSD			740	
E47 Room LSD Copy Room	11 ³⁰	↓	760	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 8-26-02

Location: _____

IH: JED/DAF

2nd Floor

Sample Location/Activity/Name	Time	Parameter	Result	Method
ST E48 Senate Chamber	11:35	CO ₂	760	
E49 Room 55	11:37		730	
E50 Room 56			740	
E51 N Hall	11:41		810	
E52 E Hall			760	
E53 Senate Lobby	11:44		820	
E54 Next to Room 209	11:46		820	
E55 Room 213			530	
E56 Room 214	11:48		580	
E57 House Lobby			710	
SB E58 House Chamber	11:50		680	
E59 Room 114			700	
E60 N Hall	11:52	✓	840	

Carbon Dioxide Data

Project: Wyoming State Capitol Condensate Project

Date: 8/27/02

Location: _____

IH: D. Fernandez

Location	³⁰ 8:00 AM	10:00 AM	12:00 PM	2:00 PM	^{3:00} 4:00 PM
E1	790		720		800
E2	820		700		810
E3	790		800		820
E4	810		830		770
E5	810		820		860
E6	780		770		890
E7	760		770		840
E8	730		700		830
E9	710		820		820
E10	830		780		890
E11	760		740		780
E12	900		870		980
E13	730		710		850
E14	760		790		830
E15	760		780		840
E16	710		760		880
E17	800		770		900
E18	720		740		830
E19	750		720		770
E20	820		780		780
E21	800		870		800
E22	770		760		700
E23	740		730		710
E24	740		770		770
E25	790		750		780
E26	740		720	720	790
E27	780		740		1040
E28	720		710		700

3:11

3:25

2:57

8/27/02
DAF

8:35 →

12:00

3:00

E29	810		790	730
E30	830		740	730
E31	790		720	790
E32	770		750	890
E33	820		780	820
E34	770		720	800
E35	800		740	820
E36	800		770	840
E37	760	(1:20)	740	730
E38	760		710	690
E39	710		740	740
E40	720		* 780 710	750
E41	720		700	720
E42	730		680	720
E43	720		730	750
E44	840		740	730
E45	830		710	720
E46	750		700	740
E47	760		820	850
E48	770 720	(1:40)	730	790
E49	710		700	770
E50	700		750	840
E51	700		730	830
E52	710		750	820
E53	740		720	800
E54	760		730	800
E55	810		790	880
E56	840		810	830
E57	710		700	730
E58	710		710	730
E59	730		710	710
E60	750	(2:35)	780	740

3:40

* door locked
measured outside door

10:15 →
*

10:50

* locked measured outside door

LS 213

Carbon Dioxide Data

Project: Wyoming State Capitol Condensate Project

Date: 8/28/02

Location: _____

IH: JED

Location	8:00 AM	10:00 AM	12:00 PM	2:00 PM	4:00 PM
E1					830
E2					840
E3					830
E4					920
E5					960
E6					1330/1170
E7					911
E8					870
E9					870
E10					820
E11					870
E12					820
E13					810
E14					830
E15					890
E16					860
E17					880
E18					780
E19					830
E20					occupied
E21					840
E22					820
E23					810
E24					760
E25					770
E26					800
E27					840
E28					800

8/28/02
JED

E29					780
E30					810
E31					840
E32					860
E33					870
E34					860
E35					830
E36					870
E37					880
E38					870
E39					N/A
E40					↓
E41					
E42					820
E43					N/A
E44					870
E45					840
E46					930
E47					910
E48					900
E49					920
E50					920
E51					850
E52					880
E53					920
E54					880
E55					900
E56					950
E57					830
E58					830
E59					920
E60					880

Sampling Data

Project:	Wyoming State Capitol Building Condensate Project	Date:	9-18-02
Location:		IH:	J. Dennison

At 0-Cen

Sample Location/Activity/Name	Time	Parameter <i>Flow Rate</i>	Result <i>Volume</i>	Method
M1 Bsm: Rm 171 at tunnel door	15:18 15:28	15.0	150.0	
M2: Location S1 Rm 9.3	15:24:30 15:24:30	15.0	150.0	
M3: Bsm: S side entrance east of main door ^{outside}	15:32 15:42	15.0	150.0	
M4 Rm 86	15:36:30 15:46	15.0	142.5	
M5 Location S4 Rm 110	15:50:30 16:00:30	15.0	150.	
M6 Inside ab doors to entrance ^{@ 119}	15:53:30 16:03:00	15.0	142.5	
M7 2nd floor Senate Chamber	16:02:30 16:12:30	15.0	150.	
M8 3rd floor Senate lobby	16:07:15 16:17:15	15.0	150.	
M9 2nd floor Hse. Chamber	16:21:10 16:31:10	15.0	150.	
M10 Bsm: S. Side ^{outside} entrance east of main	16:24:45 16:35:00	15.0	153.8	
M11 Rm 134 Gov. Office, S side	16:42:25 16:53:25	15.0	165.	
M12 Rm 134 Gov. Office, Near Conf. Table - ^(N. side)	16:43:30 16:54:30	15.0	165.	

Sampling Data

Project: Wyoming State Capitol Building Condensate Project

Date: 9-19-02

Location: _____

IH: JED

Sample Location/Activity/Name	Time	Parameter	Result	Method
M13 Gov's Office, near conference table	9:22:30 9:33:30	Mold	15.0 CFU/m	Air
M14 " " duplicate " " "	9:33:40 9:43:40	"	"	"
M15 " " Fan Coil Unit @ E. Wall, ledge below coils	-	"	-	Swab
M16 " " " " " " , on coils	-	"	-	"
M17 " " " " " " drip pan cold side	-	-	-	"
M18 E. End Basement Mech Rm, drain line lower AHU	-	"	-	"
M19 Room 18.2 Under table on S. Side	2:47:30 2:57:30	"	15.0 CFU/m	Air
M20 Backyard, outside S. side entrance	13:35:00 13:45:00	"	15.0 CFU/m	Air
M21 Room 17.1, near tunnel door to chillers	13:51:00 14:01:00	"	"	Air
M22 Room 8.6 near window	14:06:30 14:16:30	"	"	"
M23 NOT TAKEN	-	-	-	-
M24 Same as M19	N/A	Mold	-	Carpet
M25 Room 13, near door to Room 8.5	"	"	"	"

Swabs: Envarswab/Neutralizing buffer.

Sampling Data

Project:	<u>Wyoming State Capitol Building Condensate Project</u>	Date:	<u>9-19-02</u>
Location:		IH:	<u>JED</u>

Sample Location/Activity/Name	Time	Parameter	Result	Method
M26 Room 17.1 near tunnel to chiller	—	Mold	—	Carpet
M27 Gov's office, S. Wall near fan coil unit	—	"	"	"
M28 Gov's office, E. Wall near fan coil, under curtain	—	"	—	"
M29 Room 8.6, SE Corner floor near damaged wall	—	"	—	"
M30 Gov's office, top of picture frame E Wall	—	Mold	—	Tape
M31 " " , top of door frame, N. Wall, E. end ^{Closed door}	—	"	—	"
M32 Room 18.2 Under table on S. side	—	"	—	"
M33 Room 13, top of door frame, S. wall	—	"	—	"
M34 Room 8.6 top of picture frame on bookshelf in SE corner, near damaged wall	—	"	—	"

Capitol Building Indoor Air Quality Lab Reports





Princeton Analytical

Air Analyses & Consulting
47 Maple Avenue
Flemington, NJ 08822

(908) 806-2620
Fax (908) 806-2409
Email: princetonlab@blast.net

Summary of Results

Century Environmental Hygiene, Inc.
701 Ponderosa Dr.
Fort Collins, CO 80521
Attention: James E. Dennison


Report Date: 09/26/02
Job Number: 2635 rev.
Date Received: 9/19/02

Project #: Capitol

Analysis: PM 2.5 Analysis, Gravimetric

Sample ID	PAL ID	mg	µg/m ³	
T2.5-01	2635-01	0.03	0.02	
T2.5-02	2635-02	-0.03	< 0.02	
T2.5-03	2635-03	0.03	0.02	
T2.5-04	2635-04	0.01	< 0.01	
T2.5-05	2635-05	0.04	0.03	
T2.5-06	2635-06	0.01	< 0.01	
T2.5-07	2635-07	0.04	0.02	Badly torn filter
T2.5-08	2635-08	0.03	0.2	
T2.5-09	2635-09	0.04	0.2	Slightly torn filter
T2.5-10	2635-10	0.04	0.4	

Note: Calculations of concentrations in air are based upon air sampling data reported by client.


Jane E. Dennison, Ph.D., CIH
Laboratory Director

Analyst: D. Mitchell

Page 1 of 2

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Princeton Analytical

Air Analysis & Consulting
47 Maple Avenue
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Email princetonlab@blast.net

Summary of Results

Century Environmental Hygiene, Inc.
701 Ponderosa Dr.
Fort Collins, CO 80521
Attention: James E. Dennison


Report Date: 09/26/02
Job Number: 2635rev
Date Received: 9/19/02

Project #: Capitol

Analysis: PM 10 Analysis, Gravimetric

Sample ID	PAL ID	mg	mg/m3
T10-01	2635-11	0.05	0.03
T10-02	2635-12	0.02	0.01
T10-03	2635-13	0.04	0.02
T10-04	2635-14	0.08	0.05
T10-05	2635-15	0.01	< 0.01
T10-06	2635-16	0.00	< 0.01
T10-07	2635-17	0.04	0.02
T10-08	2635-18	0.07	0.05
T10-09	2635-19	0.04	0.03
T10-10	2635-20	0.00	< 0.02

Note: Calculations of concentrations in air are based upon air sampling data reported by client.


Jane E. Dennison, Ph.D., CIH
Laboratory Director

Analyst: D. Mitchell

Page 2 of 2

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REQUEST FOR INDUSTRIAL HYGIENE ANALYSIS

Address:

Project #:

Site:

Sampled By:

Date: _____

ANALYSES

☐ Standard Turn-Around

☒ RUSH - Date: _____ Time: _____

Advance Notification Required. See Free Schedule for Surcharges.

☐ Fax Results To:

Fax #: 970 221 5464

☐ Phone Results To:

Phone #:

Parameter:

Method:

Matrix/Lot:

Expected Interferences:

CALIBRATION

Pre:

Date:

Post:

Date:

12.5

Print Name

Relinquished By:

Vin Deane

Signature

Signature _____

Date & Time

Relinquished By:

Received by Lab:

SAMPLES RECEIVED AFTER 3 PM WILL BE CONSIDERED AS NEXT DAY'S BUSINESS.

INVOICE TO: ☐ Above Address

☐ Address Below

Send Invoice To:

FOR PAL USE ONLY:

PAL Job #:

PO Number:

THE YELLOW COPY WILL BE RETURNED WITH YOUR REPORT. PLEASE RETAIN PINK COPY FOR YOUR RECORDS.



Princeton Analytical
47 Maple Avenue
Flemington, NJ 08822
Tel: (908) 806-2620
Fax: (908) 806-2409
E-mail: PALihlab@aol.com

REQUEST FOR INDUSTRIAL HYGIENE ANALYSIS

Company Name: *Century Environmental*

Address:

Project #: *Capital*

Site:

Sampled By:

Date:

DUE DATE

☐ Standard Turn-Around

☒ RUSH - Date: Time:

Advance Notification Required. See Fee Schedule for Surcharges.

☐ Fax Results To:

Fax #: *970 221 5464*

☐ Phone Results To:

Phone #:

ANALYSES

Parameter: *Dust*

Method: *Gravimetry*

Matrix/Lot:

Expected Interferences:

CALIBRATION

Pre:

Date:

Post:

Date:

No.	Sample Identification	Flow Rate (L/Min)	Start Time	Stop Time	Time (Minutes)	Volume (Liters)	Comments
<i>01</i>						<i>1686</i>	
<i>02</i>						<i>1687</i>	
<i>03</i>						<i>1672</i>	
<i>04</i>						<i>1705</i>	
<i>05</i>						<i>1733</i>	
<i>06</i>						<i>1698</i>	
<i>07</i>						<i>1709</i>	
<i>08</i>						<i>1334</i>	
<i>09</i>						<i>1295</i>	
<i>10</i>						<i>1283</i>	

CHAIN OF CUSTODY:

Print Name

Signature

Date & Time

Relinquished By:

Jim Deane

[Signature]

09/15/02

Relinquished By:

Received by Lab:

SAMPLES RECEIVED AFTER 3 PM WILL BE CONSIDERED AS NEXT DAY'S BUSINESS.

INVOICE TO:

☐ Above Address

☐ Address Below

Send Invoice To:

FOR PAL USE ONLY:

PAL Job #:

PO Number:

THE YELLOW COPY WILL BE RETURNED WITH YOUR REPORT. PLEASE RETAIN PINK COPY FOR YOUR RECORDS.



Rocky Mountain Radon Control Inc.
24521 Ben Kelly Road
Elbert, CO 80106 (303) 980-1961

Customer	Century Environmental Hygiene
address	Wyoming State Capitol
Start date	08/26/02
Start Time	14:25
Stop Date	08/28/02
stop time	14.25
count date	08/30/02
count time	8:06
canister counts	3475
bk counts	3283
Standard counts	79355
Cal factor	0.114
Location	Basement
Can #	579RA40VC

Exposure Time	48.00
Decay Time	65.68
Decay Factor	0.6087
Efficiency	3.1963

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.



Rocky Mountain Radon Control Inc.
24521 Ben Kelly Road
Elbert, CO 80106 (303) 980-1961

Customer address	Century Environmental Hygiene
Start date	Wyoming State Capitol
Start Time	08/26/02
Stop Date	14:18
stop time	08/28/02
count date	14:18
count time	08/30/02
canister counts	7:30
bk counts	3389
Standard counts	3283
Cal factor	79355
Location	0.114
Can #	Basement
	607RA40VC

Exposure Time	48.00
Decay Time	65.20
Decay Factor	0.6109
Efficiency	3.1963

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.



Rocky Mountain Radon Control Inc.
24521 Ben Kelly Road
Elbert, CO 80106 (303) 980-1961

Customer	Century Environmental Hygiene
address	Wyoming State Capitol
Start date	08/26/02
Start Time	14:14
Stop Date	08/28/02
stop time	14:14
count date	08/30/02
count time	8:00
canister counts	3556
bk counts	3283
Standard counts	79355
Cal factor	0.114
Location	Basement
Can #	319RA40VC

Exposure Time	48.00
Decay Time	65.77
Decay Factor	0.6083
Efficiency	3.1963

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.



Rocky Mountain Radon Control Inc.
24521 Ben Kelly Road
Elbert, CO 80106 (303) 980-1961

Customer	Century Environmental Hygiene
address	Wyoming State Capitol
Start date	08/26/02
Start Time	14:07
Stop Date	08/28/02
stop time	14:07
count date	08/29/02
count time	18:30
canister counts	3558
bk counts	3283
Standard counts	79355
Cal factor	0.114
Location	Basement
Can #	443RA40VC

Exposure Time	48.00
Decay Time	52.38
Decay Factor	0.6730
Efficiency	3.1963

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	13:35
Stop Date	08/28/02
Stop time	13:35
Count date	08/30/02
Count time	10:00
Canister counts	3457
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	81RA40VC
NOTE	

Exposure Time	48.00
Decay Time	68.42
Decay Factor	0.5962
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
 Address Wyoming State Capitol Building
 Start date 08/26/02
 Start Time 13:40
 Stop Date 08/28/02
 Stop time 13:40
 Count date 08/30/02
 Count time 8:30
 Canister counts 3402
 Bk counts 3267
 Standard counts 79968
 Cal factor 0.114
 Location Basement
 Can # 1144RA40VC
 NOTE

Exposure Time	48.00
Decay Time	66.83
Decay Factor	0.6034
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/h as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	13:44
Stop Date	08/28/02
Stop time	13:44
Count date	08/30/02
Count time	8:39
Canister counts	3422
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	6001RA40VC
NOTE	

Exposure Time	48.00
Decay Time	66.92
Decay Factor	0.6030
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 13:55
Stop Date 08/28/02
Stop time 13:55
Count date 08/30/02
Count time 8:56
Canister counts 3386
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 380RA40VC
NOTE

Exposure Time	48.00
Decay Time	67.02
Decay Factor	0.6026
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	14:00
Stop Date	08/28/02
Stop time	14:00
Count date	08/30/02
Count time	9:15
Canister counts	3543
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	6542RA40VC
NOTE	

Exposure Time	48.00
Decay Time	67.25
Decay Factor	0.6015
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	14:05
Stop Date	08/28/02
Stop time	14:05
Count date	08/30/02
Count time	9:50
Canister counts	3495
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	1005RA40VC
NOTE	

Exposure Time	48.00
Decay Time	67.75
Decay Factor	0.5992
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	14:23
Stop Date	08/28/02
Stop time	14:26
Count date	08/30/02
Count time	8:11
Canister counts	3318
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	6372RA40VC
NOTE	

Exposure Time	48.05
Decay Time	65.78
Decay Factor	0.6082
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer	Century Environmental Hygiene
Address	Wyoming State Capitol Building
Start date	08/26/02
Start Time	14:23
Stop Date	08/28/02
Stop time	14:25
Count date	08/30/02
Count time	8:20
Canister counts	3414
Bk counts	3267
Standard counts	79968
Cal factor	0.114
Location	Basement
Can #	777RA40VC

NOTE

Exposure Time	48.03
Decay Time	65.93
Decay Factor	0.6075
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 14:37
Stop Date 08/28/02
Stop time 14:37
Count date 08/29/02
Count time 19:00
Canister counts 3166
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 6782RA40VC
NOTE

Exposure Time	48.00
Decay Time	52.38
Decay Factor	0.6730
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 14:37
Stop Date 08/28/02
Stop time 14:37
Count date 08/30/02
Count time 8:45
Canister counts 3324
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 1124RA40VC

NOTE

Exposure Time	48.00
Decay Time	66.13
Decay Factor	0.6066
Efficiency	3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
 Address Wyoming State Capitol Building
 Start date 08/26/02
 Start Time 14:35
 Stop Date 08/28/02
 Stop time 14:35
 Count date 08/30/02
 Count time 10:15
 Canister counts 3369
 Bk counts 3267
 Standard counts 79968
 Cal factor 0.114
 Location Basement
 Can # 6792RA40VC
 NOTE

Exposure Time 48.00
 Decay Time 67.67
 Decay Factor 0.5996
 Efficiency 3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 14:30
Stop Date 08/28/02
Stop time 14:30
Count date 08/29/02
Count time 19:20
Canister counts 3808
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 6562RA40VC
NOTE

Exposure Time 48.00
Decay Time 52.83
Decay Factor 0.6707
Efficiency 3.2227

Radon Concentration **0.8 pCi/L +/- 10%**

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 14:25
Stop Date 08/28/02
Stop time 14:25
Count date 08/30/02
Count time 9:40
Canister counts 3077
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 5RA40VC
NOTE

Exposure Time 48.00
Decay Time 67.25
Decay Factor 0.6015
Efficiency 3.2227

Radon Concentration <0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
 Address Wyoming State Capitol Building
 Start date 08/26/02
 Start Time 13:35
 Stop Date 08/28/02
 Stop time 13:35
 Count date 08/30/02
 Count time 9:30
 Canister counts 3615
 Bk counts 3267
 Standard counts 79968
 Cal factor 0.114
 Location Basement
 Can # 3119RA40VC
 NOTE

Exposure Time	48.00
Decay Time	67.92
Decay Factor	0.5985
Efficiency	3.2227

Radon Concentration 0.5 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
8291 South Teller Way
Littleton, CO 80128 (303) 980-1961

Customer Century Environmental Hygiene
Address Wyoming State Capitol Building
Start date 08/26/02
Start Time 13:47
Stop Date 08/28/02
Stop time 13:47
Count date 08/30/02
Count time 8:50
Canister counts 3651
Bk counts 3267
Standard counts 79968
Cal factor 0.114
Location Basement
Can # 6662RA40VC
NOTE

Exposure Time	48.00
Decay Time	67.05
Decay Factor	0.6024
Efficiency	3.2227

Radon Concentration 0.6 pCi/L +/- 10%

Rocky Mountain Radon Control Inc. (RMRC) is not responsible for the improper use or placement of canisters. Reliability of the results may be subject to marked variability. RMRC's liability is limited solely to the cost of the canisters provided.

The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.

NEHA ID: 100307RT



Rocky Mountain Radon Control Inc.
24521 Ben Kelly Road
Elbert, CO 80106 (303) 980-1961

Customer address	Century Environmental Hygiene
Start date	Wyoming State Capitol
Start Time	08/26/02
Stop Date	14:10
stop time	08/28/02
count date	14:10
count time	08/30/02
canister counts	7:50
bk counts	6024
Standard counts	3283
Cal factor	79355
Location	0.114
Can #	Basement
	65RA40VC

Exposure Time	48.00
Decay Time	65.67
Decay Factor	0.6087
Efficiency	3.1963

Radon Concentration 4.3 pCi/L +/- 10%

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The E.P.A. and the Centers for Disease Control have set a CONTINUOUS EXPOSURE Level of 4pCi/l as a guidance level for further testing and/or remedial action.



Century Environmental Hygiene, Inc.

701 Ponderosa Drive, Fort Collins, CO 80521
(970) 266-8000 (Ph.) (970) 221-5464 (Fax)

Rocky Mountain Radon Control
8291 South Teller Way
Littleton, CO 80128
(303) 980-1961
(303) 904-9771

Atn: Don

Radon		8/26/02 Start	8/28/02 End
Canister	3119	13:35	13:35
	81	13:35	13:35
	1144	13:40	13:40
	6001	13:44	13:44
	6662	13:47	13:47
	380	13:55	13:55
	6542	14:00	14:00
	1005	14:05	14:05
	443	14:07	14:07
	65	14:10	14:10
	319	14:14	14:14
	607	14:18	14:18
	579	14:25	14:25
	6372	14:23	14:26 *
	777	14:23	14:25 *
	5	14:25	14:25
	6562	14:30	14:30
	6792	14:35	14:35
	1124	14:37	14:37
	6782	14:37	14:37

All canisters were sealed on 8/28/02 at the same time they were unsealed on 8/26/02 with the exception of two canisters, which were a couple of minutes longer. See *



Rocky Mountain Radon Control, Inc.

8291 South Teller Way

Littleton, CO 80128

303-980-1961

fax 904-9701

1. 12 hours before and during the test period, doors and windows should be closed, except for normal entry and exit.
2. Room air conditioners, attic fans, including window, bathroom, kitchen and air exchange systems which mix outside air should not be in operation.
3. Central air conditioning and furnace operation is permissible.
4. *Testing period will not be less than 48 hours, and not exceed 120 hours or 5 days.*
5. Do not test if severe storms (over 25 miles/hour winds) are predicted during measurement period.

Choosing a location

1. Canister placement should be in lowest livable area of the building.
2. Place canister at least 20 inches above the floor and at least 4 inches from objects.
3. Do not place canister close to outside walls, near drains, sump pumps, in drafts, excessive heat, sunlight, high humidity, nor in kitchen, bathroom, laundry room, porch or crawlspace.
4. Canister should not be disturbed during measurement.

Opening Canister Test

1. Remove tape and lid from canister so that the screen is facing up. Save tape and lid to reseal canister.
2. *Write down on the back of this sheet the DATE and TIME the canister cover is removed.*
3. After a minimum of 48 hours and no more than 120 hours replace lid and reseal tape around lid seam. If tape is lost, only use vinyl tape, no other.
4. *Don't forget to write down the closing DATE and TIME.*
5. **IMPORTANT: DO NOT WAIT TO MAIL! FIRST CLASS MAIL ONLY!**
Lab must receive canister within 4 days of closing the canister lid or the test is no good.
6. A report of the air sample taken for radon gas in pCi/l will be mailed to the customer immediately after we analyze the canister.

PLEASE FILL IN ALL INFORMATION ON THE BACK OF THIS SHEET AND MAIL FORM WITH CANISTER IMMEDIATELY.

Environmental Protection Agency RPP ID: 2294900/180610T (Don Bronson, President of RMRC) National Environmental Health Association certification ID: 101098

AL1/100307RT

FRS Geotech, Inc.
1441 W. 46th Ave., Suite 14
Denver, CO 80211-2338

Phone: 303/477-2559
800/386-3136
FAX: 303/477-2580
e-mail: frsgeo@ix.netcom.com

September 19, 2002

Mr. James Dennison
Century Environmental Hygiene
701 Ponderosa Drive
Fort Collins, CO 80521-

Re: Lab Number 105984 Project: CAP

Dear Mr. James Dennison:

The bulk samples submitted to FRS Geotech, Inc. have been analyzed by polarized light microscopy (PLM), the EPA-recommended method for determination of fibrous constituents in building materials. The percent of asbestos contained in the samples is a visual estimation based upon comparisons with published charts. The results of these analyses are summarized in the enclosed table. This report relates only to the items received and tested by our laboratory. According to requirements set by the National Institute of Standards and Technology/NVLAP, this report must not be used to claim endorsement by NVLAP or any agency of the US Government. Also, NVLAP guidelines specify that this report should not be reproduced, except in full, without the written approval of FRS.

A copy of your Chain of Custody is attached for your convenience. This report is considered highly confidential. Results will not be discussed with any person not associated with you.

Please call if you have any questions about this work.

Sincerely,



David A. Schroeder, Ph.D.
Data Controller

Enclosures

NVLAP Accredited Lab #102078-0
AIHA Accredited Lab #101557

FRS GEOTECH, INC.
1441 W. 46th Avenue, Suite 14
Denver, CO 80211-2338

Phone: 303/477-2559
800/386-3136
Fax: 303/477-2580

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Client: Century Environmental Hygiene

Lab No.: 105984

Project ID: CAP

Page: 1 of 5

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091702-C01	ND**	/ /	[Off-white perlitic plaster]
091702-C02*	Trace	/ /	[Floor tile with adhesive]
091702-C02 [A]	Trace	/ /	[Beige floor tile]
091702-C02 [B]	ND**	/ /	[Yellow adhesive]
091702-C03*	ND**	/ /	[Sheetrock with surface material and paint]

Analyses (percents determined by visual estimation)

Sample Number:	091702-C01	091702-C02*	091702-C02 [A]	091702-C02 [B]	091702-C03*
Layer Percent:	100	100	99	1	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile		Trace <1%	Trace <1%		
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	Trace <1%	Trace <1%	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass		10	10		Trace <1%
Cellulose		Trace <1%		Trace <1%	6
Synthetics		2	2		
Other:					
Nonfibrous Material	100	87	87	99	93

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected.

Analyst: David A. Schroeder
David A. Schroeder

Date: 09/18/02

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<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091702-C03 [A]	ND**	/ /	[White sheetrock with inseparable gray cardboard]
091702-C03 [B]	ND**	/ /	[White surface material with inseparable yellow paint]
091702-C04	15	/ /	[Gray cementitious board]
091702-C05	ND**	/ /	[Off-white and white material]
091702-C06	ND**	/ /	[White material]

Analyses (percents determined by visual estimation)

Sample Number:	<u>091702-C03</u> <u>[A]</u>	<u>091702-C03</u> <u>[B]</u>	<u>091702-C04</u>	<u>091702-C05</u>	<u>091702-C06</u>
Layer Percent:	60	40	100	100	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile			15		
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	15	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass	Trace <1%				
Cellulose	10				
Synthetics					
Other:					
Nonfibrous Material	89	100	85	100	100

* Composite analysis (multilayered sample, see individual layer analyses).

** ND means None Detected.

Analyst:

David A. Schroeder

Date: 09/18/02

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Page: 3 of 5

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091702-C08	ND**	/ /	[Inseparable multiple layers of gray, green, tan, and white materials]
091702-C09	ND**	/ /	[Tan and gray debris]
091702-C10	ND**	/ /	[Pink and yellow debris] [also contains a trace of talc]
091702-C11	ND**	/ /	[Off-white and white debris]
091702-C12*	ND**	/ /	[Plaster with paints]

Analyses (percents determined by visual estimation)

Sample Number:	091702-C08	091702-C09	091702-C10	091702-C11	091702-C12*
Layer Percent:	100	100	100	100	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass					
Cellulose					
Synthetics			Trace <1%	Trace <1%	Trace <1%
Other:			Trace <1%		Trace <1%
			Non-asbest. trem./actin.		
Nonfibrous Material	100	100	99	99	99

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected.

Analyst: David A. Schroeder
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Date: 09/18/02

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Client: Century Environmental Hygiene

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Project ID: CAP

Page: 4 of 5

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091702-C12 [A]	ND**	/ /	[Gray plaster]
091702-C12 [B]	ND**	/ /	[Inseparable multiple layers of white and gray paints]
091702-C13	ND**	/ /	[White and tan debris]
091702-C14	ND**	/ /	[White and yellow debris]
091702-C15	ND**	/ /	[Off-white debris]

Analyses (percents determined by visual estimation)

Sample Number:	091702-C12 [A]	091702-C12 [B]	091702-C13	091702-C14	091702-C15
Layer Percent:	60	40	100	100	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass					
Cellulose	Trace <1%				20
Synthetics					Trace <1%
Other:		Trace <1%	5	Trace <1%	
		Non-asbest.	Bassanite	Bassanite	
		trem./actin.			
Nonfibrous Material	99	99	95	99	79

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected.

Analyst: David A. Schroeder
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Date: 09/18/02

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Page: 5 of 5

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091702-C16	ND**	/ /	[White and yellow debris]
091702-C17	ND**	/ /	[Tan and gray debris]

Analyses (percents determined by visual estimation)

Sample Number:	091702-C16	091702-C17			
Layer Percent:	100	100			
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**			
Other Fibrous Materials:					
Fibrous Glass					
Cellulose	Trace <1%	Trace <1%			
Synthetics					
Other:					
Nonfibrous Material	99	99			

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected.

Analyst: David A. Schroeder
David A. Schroeder

Date: 09/18/02

This report is concerned only with results of tests performed on samples submitted to and tested by FRS Geotech, Inc.

Bulk Sample Analytical Procedures

Bulk samples of construction materials are analyzed according to the *Method for the Determination of Asbestos in Bulk Building Materials* (EPA/600/R-93/116) which the EPA recommends as the "preferred substitute" to the old *Interim Method*. In areas where the "new" *Method* is silent, FRS follows the "old" *Interim Method* and/or specific rulings issued by the various regulatory agencies.

Each separable layer or portion of the sample is individually analyzed and reported, along with each layer's volume percent as a part of the total sample. Additionally, an arithmetic composite for the total sample, as received by the lab, is reported for layered samples. Information on the nature and quantity of materials at the sampling site, which is unavailable to FRS, must be used by the client to determine whether or not this arithmetic composite of the sample is representative of the materials, as they exist in place. This same information must be used by the client to determine whether or not any layered material, as it exists in place, should be treated as several different materials or as a composite material.

Each sample layer is prepared and analyzed in refractive index oils that are certified by the manufacturer, Cargille Laboratories. Refractive indices are measured by the Dispersion Staining, Becke Line, or Oblique Illumination methods, according to which method is most applicable to the sample material. Asbestos content is reported as a percent of the sample, and is a visual estimation based upon gross sample examination and comparisons with published calibration charts during PLM analysis.

Sample Ashing

Ashing is a preparatory procedure carried out to eliminate many interferents and asbestos "look-alikes." A portion of the sample is placed in a furnace at 500 degrees Celsius for between 1 and 4 hours; the actual time varies according to sample type. The amount of asbestos present in the original sample is calculated, based upon the weight loss due to ashing. If the sample had a 50% weight loss, and the visual estimation of asbestos present was 20%, the amount of asbestos reported would be 10%. All ashed samples are so noted on the Final Report.

Non-Asbestiform Amphibole Minerals

Particles of NON-ASBESTIFORM anthophyllite, tremolite, and actinolite with length to width ratios equal to or exceeding 3:1 and overall lengths greater than 5 microns are occasionally detected in some bulk samples. While such particles do meet the "old" legal definition of fibers, they do not meet the classical definition of asbestos because they do not occur as bundles of parallel fibers (often exhibiting splayed ends), matted masses of individual fibers, or long, flexible, and/or curved individual fibers. The majority of mineral fibers in a sample must display these characteristics as well as exhibit a length to width ratio of at least 20:1 for the mineral to be designated "asbestos." These guidelines are specified in the "New" Method: EPA/600/R-93/116. Our Final Report refers to non-asbestiform anthophyllite, tremolite, and actinolite as either "Non-asbest. trem./actin.", or "Non-asbest. anthophyl.", whichever is appropriate.

QA/QC Procedures and the Uncertainty of Analyses

All laboratory tests are performed according to rigid QA/QC guidelines, and analytical results are traceable to known reference standards and procedures. In addition to the legal requirement that 10% of all samples received be re-analyzed, FRS Geotech re-analyzes all samples for which a trace to 3% asbestos is reported.

The New Method (EPA/600/R-93/116) contains the following Suggested Acceptable Error Table for PLM analyses with quantification by visual estimate over 100 fields of view:

Areal Percent Asbestos	Acceptable Range of Asbestos Reported
1%	>0% to 3%
5%	1% to 9%
10%	5% to 15%
20% (or more)	plus or minus 10%

Telephone (if different from above) _____

P.O. #: CAI

Return Samples

Send White & Yellow copies with samples (Yellow copy to be returned with Report). Pink copy for Client's Records.

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September 19, 2002

Mr. James Dennison
Century Environmental Hygiene
701 Ponderosa Drive
Fort Collins, CO 80521-

Re: Lab Number 105988 Project: Capitol

Dear Mr. James Dennison:

The bulk samples submitted to FRS Geotech, Inc. have been analyzed by polarized light microscopy (PLM), the EPA-recommended method for determination of fibrous constituents in building materials. The percent of asbestos contained in the samples is a visual estimation based upon comparisons with published charts. The results of these analyses are summarized in the enclosed table. This report relates only to the items received and tested by our laboratory. According to requirements set by the National Institute of Standards and Technology/NVLAP, this report must not be used to claim endorsement by NVLAP or any agency of the US Government. Also, NVLAP guidelines specify that this report should not be reproduced, except in full, without the written approval of FRS.

A copy of your Chain of Custody is attached for your convenience. This report is considered highly confidential. Results will not be discussed with any person not associated with you.

Please call if you have any questions about this work.

Sincerely,



David A. Schroeder, Ph.D.
Data Controller

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RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Client: Century Environmental Hygiene

Lab No.: 105988

Project ID: Capitol

Page: 1 of 2

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-C19	ND**	/ /	[White material]
091802-C22	ND**	/ /	[Inseparable multiple layers of off-white, pink, and green materials]
091802-C24	ND**	/ /	[Tan material]
091802-C29	ND**	/ /	[Black fibrous material]
091802-C34	ND**	/ /	[Black and white fibrous material]

Analyses (percents determined by visual estimation)

<u>Sample Number:</u>	<u>091802-C19</u>	<u>091802-C22</u>	<u>091802-C24</u>	<u>091802-C29</u>	<u>091802-C34</u>
<u>Layer Percent:</u>	100	100	100	100	100
<u>Asbestos Minerals:</u>					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
<u>TOTAL ASBESTOS</u>	<u>ND**</u>	<u>ND**</u>	<u>ND**</u>	<u>ND**</u>	<u>ND**</u>
<u>Other Fibrous Materials:</u>					
Fibrous Glass	<u>Trace <1%</u>		<u>10</u>	<u>75</u>	<u>70</u>
Cellulose	<u>25</u>		<u>Trace <1%</u>		<u>Trace <1%</u>
Synthetics					
Other:					
<u>Nonfibrous Material</u>	<u>74</u>	<u>100</u>	<u>89</u>	<u>25</u>	<u>29</u>

** ND means None Detected.

Analyst: David A. Schroeder
David A. Schroeder

Date: 09/19/02

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POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Client: Century Environmental Hygiene

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Page: 2 of 2

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-C35	ND**	/ /	[Black fibrous material]

Analyses (percents determined by visual estimation)

Sample Number: 091802-C35

Layer Percent: 100

Asbestos Minerals:

Amosite				
Anthophyllite				
Chrysotile				
Crocidolite				
Tremolite-Actinolite				
TOTAL ASBESTOS	ND**			

Other Fibrous Materials:

Fibrous Glass	75			
Cellulose				
Synthetics	Trace <1%			
Other:				
Nonfibrous Material	24			

** ND means None Detected.

Analyst: David A. Schroeder
David A. Schroeder

Date: 09/19/02

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Sample Ashing

Ashing is a preparatory procedure carried out to eliminate many interferents and asbestos "look-alikes." A portion of the sample is placed in a furnace at 500 degrees Celsius for between 1 and 4 hours; the actual time varies according to sample type. The amount of asbestos present in the original sample is calculated, based upon the weight loss due to ashing. If the sample had a 50% weight loss, and the visual estimation of asbestos present was 20%, the amount of asbestos reported would be 10%. All ashed samples are so noted on the Final Report.

Non-Asbestiform Amphibole Minerals

Particles of NON-ASBESTIFORM anthophyllite, tremolite, and actinolite with length to width ratios equal to or exceeding 3:1 and overall lengths greater than 5 microns are occasionally detected in some bulk samples. While such particles do meet the "old" legal definition of fibers, they do not meet the classical definition of asbestos because they do not occur as bundles of parallel fibers (often exhibiting splayed ends), matted masses of individual fibers, or long, flexible, and/or curved individual fibers. The majority of mineral fibers in a sample must display these characteristics as well as exhibit a length to width ratio of at least 20:1 for the mineral to be designated "asbestos." These guidelines are specified in the "New" Method: EPA/600/R-93/116. Our Final Report refers to non-asbestiform anthophyllite, tremolite, and actinolite as either "Non-asbest. trem./actin.", or "Non-asbest. anthophyl.", whichever is appropriate.

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1%	>0% to 3%
5%	1% to 9%
10%	5% to 15%
20% (or more)	plus or minus 10%

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September 24, 2002

Mr. James Dennison
Century Environmental Hygiene
701 Ponderosa Drive
Fort Collins, CO 80521-

Re: Lab Number 105989 Project: Capitol

Dear Mr. James Dennison:

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A copy of your Chain of Custody is attached for your convenience. This report is considered highly confidential. Results will not be discussed with any person not associated with you.

Please call if you have any questions about this work.

Sincerely,



David A. Schroeder, Ph.D.
Data Controller

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Client: Century Environmental Hygiene

Lab No.: 105989

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<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-C18*	ND**	/ /	[Coarse and fine plaster with paint]
091802-C18 [A]	ND**	/ /	[Brown coarse plaster with inseparable yellow, green and white layers of paint]
091802-C18 [B]	ND**	/ /	[White fine plaster]
091802-C20	ND**	/ /	[White material]
091802-C21	ND**	/ /	[White material]

Analyses (percents determined by visual estimation)

Sample Number:	091802-C18*	091802-C18 [A]	091802-C18 [B]	091802-C20	091802-C21
Layer Percent:	100	30	70	100	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass					
Cellulose	Trace <1%	Trace <1%	Trace <1%	2	2
Synthetics				5	5
Other:					
Nonfibrous Material	99	99	99	93	93

* Composite analysis (multilayered sample, see individual layer analyses).

** ND means None Detected.

Analyst:

J. Fritz Fischer

Date: 09/24/02

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Page: 2 of 4

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-C23*	ND**	/ /	[Coarse and fine plaster]
091802-C23 [A]	ND**	/ /	[Brown coarse plaster]
091802-C23 [B]	ND**	/ /	[White fine plaster]
091802-C25	ND**	/ /	[Brown coarse plaster with inseparable olive-brown paint]
091802-C26	ND**	/ /	[White material]

Analyses (percents determined by visual estimation)

Sample Number:	091802-C23*	091802-C23 [A]	091802-C23 [B]	091802-C25	091802-C26
Layer Percent:	100	5	95	100	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass					
Cellulose	1		1	Trace <1%	2
Synthetics	Trace <1%		Trace <1%		5
Other:					
Nonfibrous Material	98	100	98	99	93

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected

Analyst: J. Fritz Fischer
J. Fritz Fischer

Date: 09/24/02

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<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-C27	ND**	/ /	[Yellow material]
091802-C28	ND**	/ /	[Olive brown inseparable paint and coarse plaster]
091802-C30	ND**	/ /	[Olive-brown plaster with paint]
091802-31*	ND**	/ /	[Insulation and wrap]
091802-31 [A]	ND**	/ /	[White insulation]

Analyses (percents determined by visual estimation)

Sample Number:	091802-C27	091802-C28	091802-C30	091802-31*	091802-31 [A]
Layer Percent:	100	100	100	100	96
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	ND**
Other Fibrous Materials:					
Fibrous Glass	1			72	75
Cellulose	Trace <1%	Trace <1%		3	
Synthetics					
Other:					
Nonfibrous Material	98	99	100	25	25

* Composite analysis (multilayered sample, see individual layer analyses).
** ND means None Detected.

Analyst: J. Fritz Fischer
J. Fritz Fischer

Date: 09/24/02

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Fax: 303/477-2580

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY
POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Client: Century Environmental Hygiene

Lab No.: 105989

Project ID: Capitol

Page: 4 of 4

<u>Sample Number</u>	<u>Percent Asbestos</u>	<u>Sample Date</u>	<u>Description</u>
091802-31 [B]	ND**	/ /	[Brown wrap with silver foil. foil not analyzed]
091802-C32*	ND**	/ /	[Two layers of coarse plaster with paint]
091802-C32 [A]	ND**	/ /	[Gray coarse plaster]
091802-C32 [B]	ND**	/ /	[Brown plaster with inseparable brown paint]
091802-C33	60	/ /	[Gray insulation]

Analyses (percents determined by visual estimation)

Sample Number:	<u>091802-31</u> <u>[B]</u>	<u>091802-C32*</u>	<u>091802-C32</u> <u>[A]</u>	<u>091802-C32</u> <u>[B]</u>	<u>091802-C33</u>
Layer Percent:	4	100	80	20	100
Asbestos Minerals:					
Amosite					
Anthophyllite					
Chrysotile					60
Crocidolite					
Tremolite-Actinolite					
TOTAL ASBESTOS	ND**	ND**	ND**	ND**	60
Other Fibrous Materials:					
Fibrous Glass					
Cellulose	85	Trace <1%	Trace <1%		
Synthetics					
Other:		Trace <1%	Trace <1%		
			Hair		
Nonfibrous Material	15	99	99	100	40

* Composite analysis (multilayered sample, see individual layer analyses).

** ND means None Detected

Analyst: J. Fritz Fischer

Date: 09/24/02

This report is concerned only with results of tests performed on samples submitted to and tested by FRS Geotech, Inc.

Bulk Sample Analytical Procedures

Bulk samples of construction materials are analyzed according to the *Method for the Determination of Asbestos in Bulk Building Materials* (EPA/600/R-93/116) which the EPA recommends as the "preferred substitute" to the old *Interim Method*. In areas where the "new" *Method* is silent, FRS follows the "old" *Interim Method* and/or specific rulings issued by the various regulatory agencies.

Each separable layer or portion of the sample is individually analyzed and reported, along with each layer's volume percent as a part of the total sample. Additionally, an arithmetic composite for the total sample, as received by the lab, is reported for layered samples. Information on the nature and quantity of materials at the sampling site, which is unavailable to FRS, must be used by the client to determine whether or not this arithmetic composite of the sample is representative of the materials, as they exist in place.

This same information must be used by the client to determine whether or not any layered material, as it exists in place, should be treated as several different materials or as a composite material.

Each sample layer is prepared and analyzed in refractive index oils that are certified by the manufacturer, Cargille Laboratories. Refractive indices are measured by the Dispersion Staining, Becke Line, or Oblique Illumination methods, according to which method is most applicable to the sample material. Asbestos content is reported as a percent of the sample, and is a visual estimation based upon gross sample examination and comparisons with published calibration charts during PLM analysis.

Sample Ashing

Ashing is a preparatory procedure carried out to eliminate many interferents and asbestos "look-alikes." A portion of the sample is placed in a furnace at 500 degrees Celsius for between 1 and 4 hours; the actual time varies according to sample type. The amount of asbestos present in the original sample is calculated, based upon the weight loss due to ashing. If the sample had a 50% weight loss, and the visual estimation of asbestos present was 20%, the amount of asbestos reported would be 10%. All ashed samples are so noted on the Final Report.

Non-Asbestiform Amphibole Minerals

Particles of NON-ASBESTIFORM anthophyllite, tremolite, and actinolite with length to width ratios equal to or exceeding 3:1 and overall lengths greater than 5 microns are occasionally detected in some bulk samples. While such particles do meet the "old" legal definition of fibers, they do not meet the classical definition of asbestos because they do not occur as bundles of parallel fibers (often exhibiting splayed ends), matted masses of individual fibers, or long, flexible, and/or curved individual fibers. The majority of mineral fibers in a sample must display these characteristics as well as exhibit a length to width ratio of at least 20:1 for the mineral to be designated "asbestos." These guidelines are specified in the "New" Method: EPA/600/R-93/116. Our Final Report refers to non-asbestiform anthophyllite, tremolite, and actinolite as either "Non-asbest. trem./actin.", or "Non-asbest. anthophyl.", whichever is appropriate.

QA/QC Procedures and the Uncertainty of Analyses

All laboratory tests are performed according to rigid QA/QC guidelines, and analytical results are traceable to known reference standards and procedures. In addition to the legal requirement that 10% of all samples received be re-analyzed, FRS Geotech re-analyzes all samples for which a trace to 3% asbestos is reported.

The New Method (EPA/600/R-93/116) contains the following Suggested Acceptable Error Table for PLM analyses with quantification by visual estimate over 100 fields of view:

Areal Percent Asbestos	Acceptable Range of Asbestos Reported
1%	>0% to 3%
5%	1% to 9%
10%	5% to 15%
20% (or more)	plus or minus 10%

Telephone (if different from above)

Return Samples 5-day

Send White & Yellow copies with samples (Yellow copy to be returned with Report). Pink copy for Client's Records.

Asbestos or Sampling Data

Project: Uly State Capital Condensate Return Date: 09-10-02

Location: _____ IH: D. Fernandez

#	Type	Sample Location/Activity/Name	Pump/SN	Pre/Post	Ave Cal	Start/End	Min.	Tot. Vol.	Fbs/Fld.	Fibers/cc
S1	Bulk	Rm 9-3	14	11.7 11.7	11.7	9:57 1:37	220	2574	6.5/100 1.10	40.002
S2	Bulk	Rm 8	16	11.9 11.9	11.9	10:03 1:35	212	2523	.135	0.003
S3	Bulk	Rm 23	17	13.9 13.9	13.8	10:15 1:41	206	2843	.15	0.003
S4	Bulk	Rm 11D - (laying carpet in 15th just outside door)	32	11.2 11.2	11.2	10:30 1:52	202	2262	.375	0.008
S5	Bulk	Rm 138	25	12.7 12.5	12.6	10:55 1:50	175	2205	.195	0.004
S6	Bulk	Rm 134	32	11.2 10.7	10.95	2:23 4:44	161	1763	7.5/100 1.10	40.003
S7	Bulk	Private Chambers - 2nd floor	25	11.7 11.2	11.45	2:15 4:49	154	1763	4/100 1.10	40.003
S8	Bulk	House Chambers - 2nd floor	16	12.4 12.1	12.25	2:10 4:49	157	1923	5/100 1.10	40.003
S9	Bulk	Private Lobby - 3rd floor	14	11.2 10.6	10.9	2:10 4:18	120	1308	6/100 1.10	40.004
C	B	Field Blank	n/a						0/100	OK

CBR: Cannot be read; sample has >50% particulate

B: Blank P: Personal A: Area/Environmental BACK: Background F: Final/Clearance Analyzed by: Deborah Fernandez

Notes: Background air samples collected

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80525

Attn: Jim Demmison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091802-M1	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³)
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	46	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paeciliomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	46	NA	NA
	Total †	91	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	46	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		2	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates, prohibiting fungal spore detection.

AIHA EMLAP Lab ID # 100194

Approved EMSL Signatory
Samuel Levin M.S.
Laboratory Manager

EMSL Analytical, Inc.

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Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80525

Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³)
091802-M2	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	46	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Gnomonia	None Detected	NA	NA
	Paeclomyces	None Detected	NA	NA
	Phthomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	46	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

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Project: Capitol

Location:

EMSL Reference: 378204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³) [†]
091802-M3	<u>Mold Spores</u>			
	Agrocybe/Coprinus	137	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Artichium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	46	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoecum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paeecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphitium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	183	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

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As background density increases so does the probability and severity of underestimation (see technical addendum)

† Too Heavy to Count: refers to an overloading of background particulates, prohibiting fungal spore detection.

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Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³) [†]
091802-M4	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	289	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Puccinomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	96	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	385	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	48	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		48	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates in which fungal spore detection.

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Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091302-M5	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³) [†]
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Sternophilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	91	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	91	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	91	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity: 46 counts/meter ³				
Skin Fragment Density: 1 1 to 4 (low to high)				
Total Background Particle Density: 4 1 to 4 (low to high)				

"High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting)."

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulate, prohibiting accurate fungal spore detection.

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Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091802-M6	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³) [*]
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Plthomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphillium	None Detected	NA	NA
	Terula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	48	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	48	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		48	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

**High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).*

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulate, prohibiting fungal spore detection.

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Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80525

Attn. Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³) [†]
091802-M7	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Faeciliomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	46	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	46	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

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Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80525

Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/23/02

Date Analyzed: 9/23/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091802-M8	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³)*
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	137	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphylium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	46	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	183	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	137	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

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† Too Heavy to Count refers to an overloading of background particulate prohibiting fungal spore detection.

Approved EMSL Signatory
Samuel Levin M.S.
Laboratory Manager

AIHA EMLAP Lab ID # 100194

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ. 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Pondcrosa Drive

Fort Collins, CO 80525

Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091802-M9	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³) [†]
	Agrocybe/Coprinus	46	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoecum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphylium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total +	46	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	46	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background and the resultant probability of fungal spore detection.

Approved EMSL Signatory
Samuel Levin M.S.
Laboratory Manager

AIHA EMLAF Lab ID # 100194

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ. 08106 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80525

Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³)
091802-M10	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	45	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	892	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paeclomyces	None Detected	NA	NA
	Phthomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphillium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	89	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	1025	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		45	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		2	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus; under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates, preventing fungal spore detection.

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Laboratory Manager

AHA EML1P L25 ID # 100194

EMSL Analytical, Inc.

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Client: Century Environmental Hygiene
701 Ponderosa Drive
Fort Collins, CO 80525
Attn: Jim Dennison

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Project: Capitol

Location:

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³)
091802-M11	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	83	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paeclomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	42	NA	NA
	Total †	125	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	83	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		42	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum)

† Too Heavy to Count refers to an overloading of background particulates, prohibiting fungal spore detection.

Approved EMSL Signatory
Samuel Levin M.S.
Laboratory Manager

AIHA EM-LAF Lab ID # 160194

EMSL Analytical, Inc.

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EMSL

Client: Century Environmental Hygiene

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Fort Collins, CO 80525

Attn: Jim Dennison

Project: Capitol

Location:

EMSL Reference: 370204379

Date Received: 9/20/02

Date Analyzed: 9/20/02

Date Reported: 9/23/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
091802-M12	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³)
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthriniun	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	None Detected	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphiliun	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	42	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	42	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	42	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity: 42 counts/meter ³				
Skin Fragment Density: 1 1 to 4 (low to high)				
Total Background Particle Density: 1 1 to 4 (low to high)				

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As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates, prohibiting fungal spore detection.

AIFA EMLAP Lab ID # 100194

Approved EMSL Signatory

Samuel Levin M.S.

Laboratory Manager

EMSL Analytical, Inc.
107 Haddon Ave.
Westmont, NJ 08108
(856) 858-4800 Ext 1205

MICROBIOLOGY - CHAIN OF CUSTODY

Date Collected: 9-18-02	Date Sent: 9-18-02
Contact: Jim Dennison	Bill To: SAME
Company: Century Environmental Hygiene	
701 Pauleros Dr.	
East Collins CO 80521	
Phone: 970 266-8000	Fax: 970 221-5464

Project Name: Ceph

Air Samples	Wine & Bulk Samples
<input checked="" type="checkbox"/> Mold & Fungi by Air-O-Cell Cassette (Select turn around time)	<input type="checkbox"/> Mold & Fungi - Direct Examination (Select turn-around time) Submit cellophane tape sample or bulk
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count & identification)	<input type="checkbox"/> Mold & Fungi - Direct Examination - Follow up examination by culture if necessary
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count Only)	<input type="checkbox"/> Mold & Fungi - Culture (ID & Count)
<input type="checkbox"/> Bacterial Count & Gram Stain	<input type="checkbox"/> Mold & Fungi - Culture (Count Only)
<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)	<input type="checkbox"/> Bacterial Count & Gram Stain
Water Samples	<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)
<input type="checkbox"/> Total Count, Coliforms, Fecal Coliforms (Specify)	
<input type="checkbox"/> Other (Specify)	

RECEIVED
EMSL
WESTMONT, NJ

02 SEP 20 AM 7:51

TURN AROUND TIME:
<input type="checkbox"/> Same Day <input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> 3 Day <input type="checkbox"/> 4 Day <input checked="" type="checkbox"/> 5 Day <input type="checkbox"/> 6-10 Day

SAMPLE ID	LOCATION	VOLUME	COMMENTS
091802-			
M1, M2, M3, M5, M7, M8, M9,		150.0 L	
M4		142.5 L	
M6		142.5 L	
M10		153.8 L	
M11, M12		165. L	

received
PU 9/20/02

J Kemp

Fedex

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont. NJ. 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³) [†]
M13	<u>Mold Spores</u>			
	Agaric/ye/Coprinus	None Detected	NA	NA
	Alternaria	42	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycetes	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	208	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total *	249	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity: 42 counts/meter ³				
Skin Fragment Density: 1 1 to 4 (low to high)				
Total Background Particle Density: 1 1 to 4 (low to high)				

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates, prohibiting fungal spore detection.

AHA EMLAP Lab ID # 100194

Approved EMSL Signatory

Samuel Levin M.S.

Laboratory Manager

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EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³) [†]
M14	<u>Mold Spores</u>			
	Agrocybe/Coprinus	46	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthriniun	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	411	NA	NA
	Curularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paccilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	457	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity: 46 counts/meter ³				
Skin Fragment Density: 2 1 to 4 (low to high)				
Total Background Particle Density: 2 1 to 4 (low to high)				

*High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates prohibiting fungal spore detection.

AIHA EMLAP Lab ID # 100194

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Client: Century Environmental Hygiene

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Fort Collins, CO 80521

Attn: Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
M19	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³)*
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	91	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	46	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Canoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphilium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	137	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

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AIHA EMLAP Lab ID # 100194

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Fort Collins, CO 80521

Attn. Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration (counts/M ³)	"Background" Concentration (counts/M ³)	"Background" Corrected (counts/M ³)
M20	<u>Mold Spores</u>			
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	46	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthriniun	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	137	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paeclomyces	None Detected	NA	NA
	Phthomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphillum	None Detected	NA	NA
	Tarula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	183	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		1	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

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† Too Heavy to Count refers to an overloading of background particulates, prohibiting fungal spore detection.

AIHA EMLAP Lab ID # 100194

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Attn: Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
M21	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³)
	Agrocybe/Coprinus	46	NA	NA
	Altemaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycete	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	183	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphillium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	None Detected	NA	NA
	Hyphac	None Detected	NA	NA
	Total †	229	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		ND	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

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† Too Heavy to Count refers to an overloading of background particulates prohibiting fungal spore detection.

A/HA EMLAP Lab ID # 100194

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Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

Location:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Air-O-Cell Cassette Analysis for Mold Spores and Pollen Performed by Optical Microscopy

Sample Number	Particle Identification	Sample Concentration	"Background" Concentration	"Background" Corrected
M22	<u>Mold Spores</u>	(counts/M ³)	(counts/M ³)	(counts/M ³) [*]
	Agrocybe/Coprinus	None Detected	NA	NA
	Alternaria	None Detected	NA	NA
	Arthrospores	None Detected	NA	NA
	Ascomycetes	None Detected	NA	NA
	Aspergillus/Penicillium	None Detected	NA	NA
	Arthrinium	None Detected	NA	NA
	Basidiomycete	None Detected	NA	NA
	Bipolaris	None Detected	NA	NA
	Chaetomium	None Detected	NA	NA
	Cladosporium	91	NA	NA
	Curvularia	None Detected	NA	NA
	Epicoccum	None Detected	NA	NA
	Ganoderma	None Detected	NA	NA
	Paecilomyces	None Detected	NA	NA
	Pithomyces	None Detected	NA	NA
	Stachybotrys	None Detected	NA	NA
	Stemphium	None Detected	NA	NA
	Torula	None Detected	NA	NA
	Ulocladium	None Detected	NA	NA
	Zygomycete	None Detected	NA	NA
	Unidentifiable	46	NA	NA
	Hyphae	None Detected	NA	NA
	Total †	137	NA	NA
	<u>Other</u>			
	Pollen	None Detected	NA	NA
	Fibrous Particulate	None Detected	NA	NA
	Insect Fragment	None Detected	NA	NA
Analytical Sensitivity:		46	counts/meter ³	
Skin Fragment Density:		2	1 to 4 (low to high)	
Total Background Particle Density:		1	1 to 4 (low to high)	

^{*} High levels of background particulate can obscure pollen and mold spores leading to underestimation (thus under reporting).

As background density increases so does the probability and severity of underestimation (see technical addendum).

† Too Heavy to Count refers to an overloading of background particulates prohibiting fungal spore detection.

ATHA EMLAP Lab ID # 100194

Approved EMSL Signatory

Samuel Levin M.S.
Laboratory Manager

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Fungal Identification For the Analysis of Swab/Wipe Samples

Sample	Location	Fungal Identification	Concentration (CFU's/Swab)	Comments
M15		Yeast species	100	
M16		Yeast species	200	
M17		No Growth		
M18		Aspergillus niger Fusarium species Rhodotorula species	100 134000 >300000	

CFU = Colony Forming Unit

Concentration is reported in CFU's/Swab unless otherwise noted

AIHA EMLAP Lab ID # 100194

Approved EMSL Signatory

Samuel Levin M.S., Laboratory Manager

EMSL Analytical, Inc.

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EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02


Fungal Identification For the Analysis of Bulk Samples

Sample	Location	Fungal Identification	Concentration (CFU's/filter)	Comments
M24		No Growth		
M25		Rhodotorula species	300	
M26		No Growth		
M27		No Growth		
M29		Alternaria species	100	

CFU = Colony Forming Unit

Concentration is reported in CFU's/g unless otherwise noted

ADHA EMLAP Lab ID # 190194


Approved EMSL Signatory
Samuel Levin M.S., Laboratory Manager

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ. 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene

701 Ponderosa Drive

Fort Collins, CO 80521

Attn: Jim Dennison

Project:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/25/02

Date Reported: 9/26/02

Fungal Identification For the Analysis of Bulk Samples

Sample	Location	Fungal Identification	Concentration (CFU's/g+filter)	Comments
M28		Alternaria species Penicillium species	111111 111111	

CFU = Colony Forming Unit

Concentration is reported in CFU's/g unless otherwise noted

AIHA EMLAP Lab ID # 100194

Approved EMSL Signature

Samuel Levin M.S., Laboratory Manager

EMSL Analytical, Inc.

107 Haddon Avenue, Westmont, NJ. 08108 (856) 858-4800

EMSL

Client: Century Environmental Hygiene
701 Ponderosa Drive
Fort Collins, CO 80521

Attn: Jim Deenison

Project:

EMSL Reference: 370204395

Date Received: 9/20/02

Date Analyzed: 9/23/02

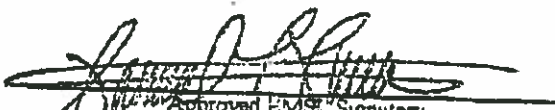
Date Reported: 9/26/02

Fungal Identification For the Analysis of Direct Examination

Sample	Location	Fungal Identification	Concentration	Comments
M30		Aspergillus/Penicillium species Bipolaris species Cladosporium species Sterile Hyphae	Many Rare Moderate Few	
M31		Alternaria species Chaetomium species Cladosporium species Stachybotrys species	Few Few Few Rare	
M32		Agrocybe species Cladosporium species Stachybotrys species	Few Few Rare	
M33		Cladosporium species Stachybotrys species Sterile Hyphae	Few Few Few	
M34		Aspergillus/Penicillium species Chaetomium species Cladosporium species Stachybotrys species Sterile Hyphae	Few Few Moderate Few Few	

Semi-Quantitative Concentrations

Rare - 1 to 4 spores seen on prep
Few - 5 to 10 spores seen on prep
Moderate - 0 to 1 per high power field
Many - 1 or more per high power field
Loaded - Little background


Approved EMSL Signatory
Samuel Levin M.S., Laboratory Manager

370204395

EMSL Analytical, Inc.
107 Haddon Ave.
Westmont, NJ 08108
(856) 858-4800 Ext 1205

MICROBIOLOGY - CHAIN OF CUSTODY

Date Collected: 9-19-02 Date Sent: 9-19-02

Contact: <u>Jim Pennison</u>	Bill To: <u>SAME</u>
Company: <u>Century Environmental Hygiene</u>	
<u>701 Parkers Dr.</u>	
<u>Fort Collins CO 80521</u>	
Phone: <u>970 266-8000</u>	Fax: <u>970 221-5464</u>

Project Name: _____

Air Samples	Wipe & Bulk Samples
<input checked="" type="checkbox"/> Mold & Fungi by Air-O-Cell Cassette (Select turn around time)	<input checked="" type="checkbox"/> Mold & Fungi - Direct Examination (Select turn-around time) Submit cellophane tape sample or bulk
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count & Identification)	<input type="checkbox"/> Mold & Fungi - Direct Examination - Follow up examination by culture if necessary
<input type="checkbox"/> Mold & Fungi by Agar Plate (Count Only)	<input checked="" type="checkbox"/> Mold & Fungi - Culture (ID & Count)
<input type="checkbox"/> Bacterial Count & Gram Stain	<input type="checkbox"/> Mold & Fungi - Culture (Count Only)
<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)	<input type="checkbox"/> Bacterial Count & Gram Stain
<u>Water Samples</u>	<input type="checkbox"/> Bacterial Count & Identification (Three most prominent types)
<input type="checkbox"/> Total Count, Coliforms, Fecal Coliforms (Specify) _____	
<input type="checkbox"/> Other (Specify) _____	

6 carpet
5 Tape
4 - 6 carpet
changed to culture
also
KCB

TURN AROUND TIME:
___ Same Day ___ 1 Day ___ 2 Day ___ 3 Day ___ 4 Day ☒ 5 Day ___ 6-10 Day

SAMPLE ID	LOCATION	VOLUME	COMMENTS
M14, M19, M20, M21, M22	(Air)	150.0	
M13	(Air)	165.0	
M24, 25, 26, 27, 28, 29	(Carpet)	-	
M15, M16, M17, M18	(Swab)	-	
M30, M31, M32, M33, M34	(Tape)	-	
<u>Chen</u>			

RECEIVED
EMSL
WESTMONT, N.J.
02 SEP 20 AM 10:00

XIII. Capitol Building Photos



Capitol Building Photos



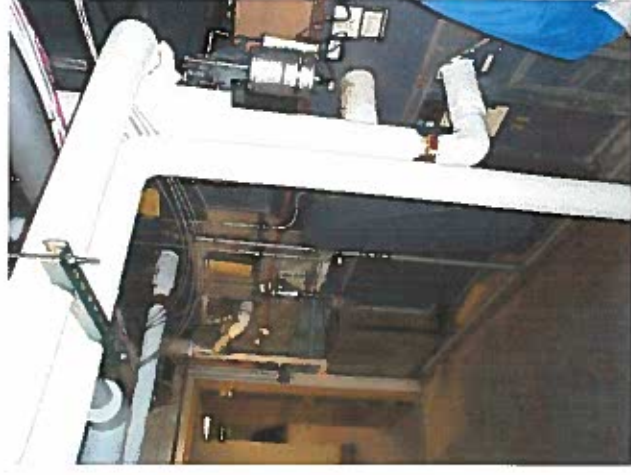
Typical Fan Coil Unit



Double Fan Coil Unit Arrangement with Pipes Behind Curtain



Typical Fan Coil Unit



Basement Air Handling Units

Capitol Building Photos



Attic Air Handling Units



Attic Ductwork



Attic Ductwork



Attic Ductwork

Capitol Building Photos



Attic Ductwork



Outside Air Intake for Basement Air Handling Units



Outside Air Intake for Attic Air Handling Units



Fan Coil Unit Behind Credenza with Exposed Pipes

Capitol Building Photos



Fan Coil Unit at Main Entrance



Boiler Room



Boiler Room

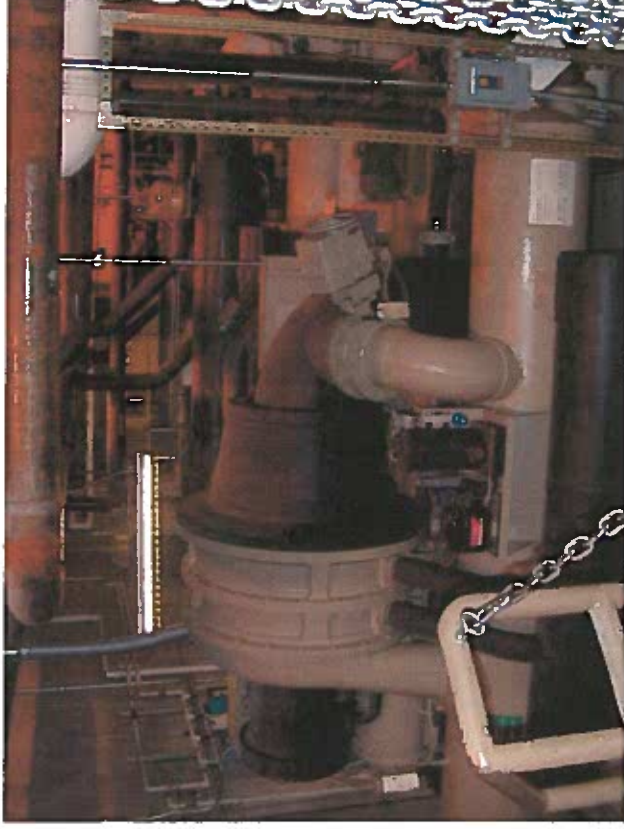


Chiller Plant

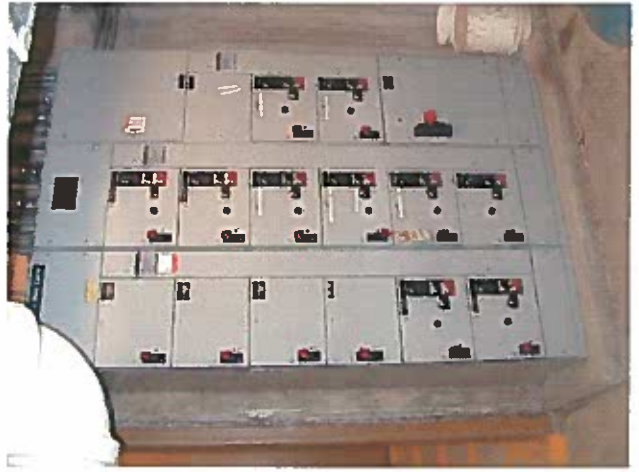
Capitol Building Photos



Chiller Plant



Chiller Plant



Motor Control Center



Electrical Panels

Capitol Building Photos



Potential Location for Heat Exchanger



Steam Condensate Pipe



Steam Condensate Pipe



Steam Condensate Pipe